

Application of Teaching Strategies for Improving Students' Situational Motivation in Physical Education

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Abstract

Introduction. Physical Education (PE) is a way of promoting sports in adolescents, and teachers can encourage this sport adherence by generating motivation in students through their teaching intervention. The aim of the study was to develop and implement teaching intervention strategies to generate an optimal motivational climate and assess their impact on different variables that affect students' situational motivation in Physical Education classes. The Achievement Goal Theory and the Self-determination Theory were taken as reference.

Method. The intervention was based on the TARGET areas, developing an orientational teaching unit with the participation of 113 3rd year ESO (secondary education) students (58 boys and 53 girls; M age = 14.83 and SD= 0.72), who were divided into an experimental group (n=46) and a control group (n=67). Different instruments were used to measure perceived motivational climate, basic psychological needs, self-determined situational motivation and affective consequences (satisfaction-enjoyment and boredom).

Results. The results showed that the experimental group obtained significantly higher values with respect to the control group in the mastery motivational climate, as well as in autonomy, perceived competence, identified regulation and satisfaction-enjoyment. The amotivation values were significantly lower in the experimental group.

Discussion. The results highlight the importance of the PE teacher transmitting task motivational climates to optimise different variables that affect motivation in PE classes, thus improving the teaching-learning process

Conclusion. We highlight that the TARGET areas are effective to optimise the teaching intervention in the orientational content and to help improve the students' motivation in PE.

Key words: teaching intervention; TARGET areas; self-determined motivation; Physical Education; motivational climate; psychological mediators.

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Aplicación de estrategias docentes para la mejora de la motivación situacional del alumnado en Educación Física

Resumen

Introducción. La Educación Física (EF) es un medio para favorecer la práctica deportiva en los adolescentes, y el profesor puede favorecer esta adherencia a la práctica generando motivación en el alumnado a través de su intervención docente. El objetivo del estudio fue desarrollar y aplicar estrategias de intervención docente para generar un clima motivacional óptimo y evaluar su incidencia sobre distintas variables que afectan a la motivación situacional de los alumnos en las clases de Educación Física, tomando como referencia la Teoría de las Metas de Logro y la Teoría de la Autodeterminación.

Método. La intervención estuvo basada en las áreas TARGET, desarrollándose una unidad didáctica de orientación deportiva donde participaron 113 alumnos de 3º de ESO (58 chicos y 53 chicas (M edad= 14.83, DT= 0.72) distribuidos en grupo experimental (n=46) y grupo control (n=67). Los instrumentos utilizados midieron la percepción del clima motivacional, las necesidades psicológicas básicas, la motivación situacional autodeterminada y las consecuencias afectivas (satisfacción-diversión y aburrimiento).

Resultados. Los resultados mostraron que el grupo experimental obtuvo, respecto al grupo control, valores significativamente superiores en el clima motivacional maestría, y también en la autonomía, la percepción de competencia, la regulación identificada y la satisfacción-diversión. Los valores de desmotivación fueron significativamente inferiores en el grupo experimental.

Discusión. Los resultados destacan la importancia de que el docente de EF transmita climas motivacionales tarea para optimizar diferentes variables que afectan a la motivación en las clases de EF, mejorando con ello el proceso de enseñanza-aprendizaje.

Conclusión. Destacamos que las áreas TARGET resultan efectivas para optimizar la intervención docente en el contenido de orientación deportiva y contribuyen a mejorar la motivación del alumnado en EF.

Palabras Clave: intervención docente; áreas TARGET; motivación autodeterminada; Educación Física; clima motivacional; mediadores psicológicos.

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Introduction

Adolescents' experiences in Physical Education (PE), in sports clubs or in physical activity (PA) in their free time may be crucial to develop more adaptive patterns in future engagement (McKenzie, 2007). It is considered within the educational area that the success of PA programmes in school PE depends to a considerable degree on the students' motivation. This can be manipulated to a certain extent by teachers and by the way they deliver the contents (Cecchini, Fernández-Rio & Méndez-Giménez, 2014; Moreno-Murcia, Cervelló, González-Cutre, Julián & Del Villar, 2011). Thus, physical activities have positive consequences both in school PE and in sport when students are motivated and experience positive cognitive and/or affective results due to their participation (Gråstén, Jaakkola, Liukkonen, Watt & Yli-Piipari, 2012). Two of the main social cognitive theories that provide theoretical constructs to learn about the motivating functioning of students in PE classes are the Achievement Goal Theory (Nicholls, 1989) and the Self-determination Theory (Ryan & Deci, 2002).

In the field of PA, the *Achievement Goal Theory* (Nicholls, 1989) has helped understand the cognitive, emotional and behavioural patterns developed in classes (Papaioannou, Ampatzoglou, Kalogiannis & Sagovits, 2008). Its main contribution is the concept of motivational climate (Ames, 1992) which is defined as the set of implicit and/or explicit signals, perceived in the environment, through which the keys to success and failure are determined. Depending on the signals used, two types of motivational climate are distinguished; the task-involving motivational climate or mastery climate and ego-involving motivational climate or execution climate (Harwood, Spray & Keegan, 2008). The task-involving motivational climate promotes cooperative learning, the choice of tasks and their mastery, and the evaluation of the students based on personal and self-reference improvement (Cervelló, Moreno, Martínez, Ferriz & Moya, 2011). On the contrary, the ego-involving motivational climate promotes interpersonal competition, it limits the individuals' choice, and uses social and public comparison in the evaluation (Braithwaite, Spray & Warburton, 2011). Likewise, the students' perception of a mastery climate is associated with adaptive behaviour such as the student's task-oriented goals, greater effort, enjoyment and intention to engage in sport (Amorose, Anderson-Butcher, Flesch & Klinefelter, 2005; Cecchini, González, Carmona & Contreras, 2004; Moreno, Cervelló & González-Cutre, 2007) whilst the perception of an execution climate provokes disadaptive behaviour, such as greater boredom, concern for the final result, affective and negative feelings of pressure (Balaguer, Duda, Castillo, Moreno & Cre-

spo, 2009; Lochbaum, Stevenson & Hilario, 2009). Likewise, other studies have shown how ego-oriented climates or performance do not really just generate disadaptive consequences, if these are combined with learning-oriented climates, offering a multi-dimensional vision of motivation in the educational area, and highlighting that students have the capacity to change or adapt the type of goal depending on the environment and on their needs (for greater development of the *Revised Goal Orientation Theory*, see De la Fuente, 2004).

The *Self-determination Theory* (Ryan & Deci, 2002) establishes motivation as a continuum where different levels of self-determination appear. Thus, we find, going from more to less self-determined motivation; intrinsic motivation, extrinsic motivation and amotivation. Intrinsic motivation represents an individual's commitment to an activity due to the enjoyment it produces, where this activity is an end in itself. Within extrinsic motivation, from more to less self-determination, we find different forms of regulation: integrated, identified, introjected and external, all of which comply with factors that are external to the individual (Deci & Ryan 2002). In the education field, whether students develop one type of motivation or another will be determined by the satisfaction of their basic psychological needs (BPN), which are typical of all human beings and explain individuals' behaviours. These psychological mediators are: the need for autonomy, including people's efforts to be the origin of their actions and determine their own behaviour; the need for competence, based on experiencing efficiency in the actions carried out; and the need for relatedness, which refers to the effort to mix with other individuals and experience satisfaction with the social world. The satisfaction of these three BPNs is associated with more self-determined forms of motivation, whilst their non-satisfaction will be associated with less self-determined forms of motivation (Deci & Ryan, 2000). In turn, the different forms of motivation can trigger different consequences in students (Vallerand, 1997). These have been classified as cognitive (e.g., concentration, attention and memory), affective (e.g., enjoyment, satisfaction and boredom) and behavioural (e.g., persistence in the task, performance). Thus, insofar as PE teachers carry out a teaching intervention that contributes to the satisfaction of these three BPNs, students will be able to experience more self-determined forms of motivation, generating more positive consequences at an affective, cognitive and behavioural level (Julián, 2012; Tessier, Sarrazin & Ntoumanis, 2010).

Moreover, these two motivational theories are based on Vallerand's hierarchical model (2001, 2007) that upholds the existence of three hierarchical levels (i.e., situational,

contextual and global). In the education field, the situational level refers to the sessions or to a teaching unit (TU), the contextual level encompasses PE in general and finally the global level is linked to an active lifestyle. This means that an improvement of motivational variables at situational level may have important consequences on the next two levels, due to the fact that motivation experienced at one level may have an influence on the one immediately above. Therefore, the PE teacher appears as an agent that promotes engagement in present and future PA (Moreno, Huéscar & Cervelló, 2012).

There are many studies in the field of PE that have tried to associate both motivational theories (Moreno, Hellín, Hellín, Cervelló & Sicilia, 2008; Liukkonen, Barkoukis, Watt & Jaakkola, 2010), where the relationships between the motivational climates perceived by the students and the satisfaction of their BPNs have been studied, observing how the promotion of a mastery climate is related to higher levels of satisfaction of the three BPNs and also to an increase in more self-determined forms of motivation (Moreno & Llamas, 2007). On the contrary, the execution or ego-involving motivational climate has been associated with amotivation (Ommundsen & Eikanger-Kvalo, 2007).

In this sense, the PE teacher acquires a fundamental role, as he/she is one of the main agents that can modify class motivational climate and that can provide an optimal motivational climate (Julián, 2012). Thus, by following the works of Ames (1992) and Epstein (1989), teachers have a series of guidelines they can use to manipulate environmental signals and foster a mastery motivational climate in their classes. These guidelines are split into six areas known with the acronym, TARGET, to refer to the dimensions of task (i.e., design of tasks and activities), authority (i.e., participation of the individual in the instructional process), recognition (i.e., reasons for the recognition, distribution of rewards), grouping (i.e., form and frequency with which the individuals interact), evaluation (i.e., establishment of standards and evaluation criteria) and time (i.e., programming flexibility possibilities). Some intervention studies, based on the TARGET areas, have been carried out within the education field of PE in the Spanish context, which have proved to be effective in achieving a greater task climate (e.g., Cecchini et al., 2001; González-Cutre, Sicilia & Moreno, 2011; Viciana, Cervelló, Ramírez-Lechuga, 2007). There are also programmes, via the implementation of the TARGET areas in the sporting context, which have proved to be extremely effective, showing significant differences in favour of the task climate and maintaining the changes stable over time (Cecchini, Fernandez-Rio, Mendez-Gimenez, Cecchini & Martins, 2014).

Likewise, there are many studies in the international context, carried out in PE classes, that have studied the effects of manipulating the task climate on different motivational variables and adaptive consequences (e.g., Bowler, 2009; Jaakkola & Liukkonen, 2006; Morgan, Kingston & Sproule, 2005; Wang, Liu, Chatzisarantis & Lim, 2010). As shown by a recent meta-analysis performed on the effectiveness of interventions via the use of the TARGET areas in the PE context, we find numerous studies that support this type of interventions and their effects at behavioural, cognitive and affective level on students (Braithwaite et al., 2011). Even so, the majority of these studies have assessed their effects mainly in the contextual level of motivation (i.e., PE in general), not carrying out a further evaluation of the results at situational level (i.e., different TUs within PE).

Objectives and hypotheses

Based on the aforementioned scientific literature, the study has a two-fold objective. Firstly, to verify the effectiveness of a differentiated intervention through the use of motivational strategies based on the TARGET areas, applied at situational level during the orientational content. As a second objective, we propose to assess the effect of this type of differentiated intervention on other motivational variables at situational level (i.e., BPNs, self-determined motivation and affective consequences). Thus, two hypotheses are put forward related to the objectives set out above. Firstly, we propose that a teaching intervention based on the use of strategies related to the TARGET areas, would reflect a greater mastery motivational climate in PE classes during the orientational content. As a second hypothesis of the study, we propose that, on generating a greater mastery motivational climate, greater satisfaction of the BPNs would be achieved, as well as higher levels of self-determined motivation and greater satisfaction and enjoyment in the students.

Method

Participants

113 PE students participated in the study (58 boys and 53 girls) with ages varying between 14 and 17 (M age = 14.83, SD = 0.72) belonging to 5 groups of 3rd year Compulsory Secondary Education (Spanish acronym, ESO) from a state school. Two groups made up the experimental group with a total of 46 students (M age = 14.83, SD = 0.77) and the three re-

maintaining groups made up the control group with a total of 67 students (M age = 14.84, SD = 0.68).

Instruments

Perceived Motivational Climate Scale (PMCS). The perceived situational motivational climate in PE classes was measured through “L’Echelle de Perception du Climat Motivational” (EPCM) from Biddle and coll. (1995), translated into Spanish and adapted by Gutierrez, Ruiz and López (2011). 16 of the 19 items that comprise this scale were used, bearing in mind four primary factors: Search for Progress by the Students, Promotion of Learning by the Teacher, Search for Comparison by the Students and Fear of Making Mistakes, which, in turn, were grouped into two secondary factors: 9 items for the Learning or Mastery Climates comprised of the first two primary factors (e.g., "Students learn new things and feel satisfied", "The teacher feels satisfied when each student learns something new") and 7 items for the Comparison or Execution Climates, comprised of the last two primary factors (e.g., "Students try to do it better than the others", "The teacher is only concerned with those who do the exercises well"). The questionnaire was headed by the sentence "In my orientational teaching unit classes...", followed by the different items. The fifth factor included in the original questionnaire (Promotion of comparison by the teacher) was eliminated from the study due to the low reliability obtained (Cronbach’s alpha = .43). Cronbach’s alpha values were obtained of .73 for the search for progress by the students, .82 for the promotion of learning by the teacher, .74 for the search for comparison by the students and .85 for the fear of making mistakes. In the two secondary factors, the task climate obtained Cronbach’s alpha values of .84 and the ego climate of .69, respectively

Basic Psychological Needs in Exercise Scale (BPNES). The version of the BPNES (Vlachopoulos & Michailidou, 2006) translated into Spanish (Moreno, González-Cutre, Chillón & Parra, 2008) was used. To evaluate the BPN at situational level, this instrument was preceded by the sentence "In the orientational teaching unit classes ..." Followed by 12 items that measure perceived autonomy (4 items; e.g., "I have the chance to choose how to carry out the exercises"), perceived competence (4 items; e.g., "I feel that I have made considerable progress with respect to the final objective that I have set myself") and perceived relatedness (4 items; e.g., "I feel very comfortable when I do the exercises with my other companions"). Cronbach’s alpha values were obtained of .66 for perceived autonomy, .69 for perceived competence and .77 for perceived relatedness.

Situational Motivation Scale (SIMS-14). The original questionnaire (Guay, Vallerand, & Blanchard, 2000), validated in the Spanish education context (Martín-Albo, Nuñez & Navarro, 2009) was adapted for PE at situational level for an orientational content. The SIMS-14 was used to evaluate situational motivation in PE students for the orientational content. It is comprised of 14 items grouped into four factors: intrinsic motivation (4 items; e.g., "because I believe it was interesting"), identified regulation (3 items; e.g., "I have done it for my own good"), external regulation (3 items; e.g., "because it is assumed that I had to do it") and amotivation (4 items; e.g., "there must be good reasons for having done the orientational, but personally I cannot see any"). Participants answered the question: "why have you taken part in the orientational units this year?" Due to the fact that this version has not been used in the context of an orientational TU in PE, the validity of the instrument was analysed through a confirmatory factor analysis (CFA) testing the same theoretical model presented in the Spanish validation of Martín-Albo and coll. (2009) and comparing it with the data obtained in this study. The results of the CFA indicated an adequate adjustment of the data for the structure of the four factors described above, through the different adjustment indices evaluated (χ^2 (71, N=113) = 119.31, $p < .001$; $\chi^2/g.l.$ = 1.68; RMSEA = .08; SRMR = .07; CFI = .94; TLI = .92). Cronbach's alpha coefficients revealed reliability values of .87 for intrinsic motivation, of .73 for identified regulation, of .72 for external regulation and of .84 for amotivation.

Scale of Enjoyment of Individuals engaging in sport (CDPD). The Spanish validation in PE (Cecchini & col., 2004) of the original (Duda & Nicholls, 1992) was used. This questionnaire measures the situational enjoyment of individuals when they engage in the TU evaluated. The questionnaire contains 8 items grouped into two factors called boredom (3 items; e.g., "I was normally bored during the orientational classes") and satisfaction-enjoyment (5 items; e.g., "I used to have fun doing orientation"). The first question of the questionnaire is "Have you enjoyed yourself in the orientational classes this year?" The reliability analysis obtained Cronbach's alpha values of .90 for satisfaction-enjoyment and .86 for boredom.

The answers to the different items of all the questionnaires were reflected in a Likert type scale with the response range of 1 to 5, where 1 corresponded to totally disagree and 5 to totally agree. In the case of variables that presented reliability of less than .70 (ego climate with values of .69, perceived autonomy with values of .66, and perceived competence with

values of .69), these can be considered acceptable due to the small number of items that comprise the factor (Hair, Anderson, Tatham & Black, 1998; Nunnally & Bernstein, 1995).

Procedure

In the first place, the directors of this school were contacted to explain the objectives of the study to them and to get their consent to deliver one of the teaching units of the PE teacher's yearly teaching programme, as well as to administer different questionnaires.

Prior to the teaching intervention, the experimental group teacher was specifically instructed to adequately transmit a mastery climate through different intervention strategies. The training focused on knowledge of the motivational theories of Achievement Goals and Self-determination, as expressed above, and on how to apply the method in the school PE context. The teacher's intervention in the experimental group entailed applying a series of strategies based on the six TARGET areas (task, authority, recognition, grouping, evaluation and time) established by Ames (1992) with support from the guidelines of Julián and Pinos (2011) for the orientational content. At the end of the TU, the different questionnaires were given out in the classroom, both to the control group and to the experimental group, with the presence of the principal investigator and the absence of the PE teacher. Before completing the questionnaire, a series of instructions were given on how to complete them, they were encouraged to answer as sincerely as possible because the questionnaires were anonymous and were not going to form part of the evaluation of the TU. Time spent by the students on completing varied from 15 to 20 minutes.

Intervention in the experimental group

The strategies used during the TU in the experimental group are presented below in summarised form. With respect to the task dimension, activities were designed based on variety, respecting the students' possibilities and limitations. Personal challenge was sought through progression in the activities, establishing different levels of engagement. Finally, and always at the start of the sessions and of the activities, the objectives to be achieved were highlighted.

With respect to the authority dimension, the individuals were involved in the decision-making process, allowing them to take decisions about certain aspects of the teaching-learning process such as the placement of markers, the time to look for them or the place

where they were situated. The aim was to foster self-control and self-management in the students, establishing a certain time to discover all the markers, so they controlled themselves to achieve this in the time established. Three types of feedback were provided, descriptive (commenting with the students how they had carried out the action), explanatory (analysing the reasons for their failure) and interrogative (leading the students to reflect for themselves in order to obtain the specific knowledge of the activity). Feedback was also provided to each student, at least once during each session.

Furthermore, in the grouping dimension, relatedness among the students was fostered by proposing activities in pairs or small groups. The groupings were flexible and heterogeneous, with small variations during the activities of one same session and throughout all the sessions.

With respect to the evaluation, a diagnostic evaluation was designed that allowed the teacher to establish the different motor situations, bearing in mind the possibilities and limitations with respect to the content. The students were involved in the evaluation process, giving them the possibility to choose the scoring percentages of the criteria to be evaluated, respecting some minimum criteria established by the teacher. The evaluation process was private and significant, personally and individually informing each student of the results. Progress and personal mastery with respect to the initial evaluation were evaluated to a great extent.

Finally, sufficient time was given over to develop the different activities, respecting the pace of learning of each individual student and working group. Thus, the students had the chance to consolidate the different specific knowledge and to increase their perceived competence.

Intervention in the control group

On the other hand, the teacher that gave the TU in the control group did not receive any instruction and gave the classes without bearing in mind the intention of transmitting a mastery climate. Following the categorisation developed above of the TARGET areas, it was possible to observe that insofar as the task area is concerned, there was not always variety in the tasks, as some of them were repeated in different sessions. One important aspect is that the tasks could not be adapted and did not permit different levels of difficulty, either. The level

was common for the entire group. The teacher did not transmit the objectives to be reached to the students and only did so at the start of the session, to inform of the general objectives.

Insofar as the authority dimension is concerned, the teacher did not leave any of the tasks open, using a more controlling teaching style, thus preventing students from taking any type of decision or developing their autonomy. As different levels of difficulty were not established, the students did not have the same recognition possibilities and only those pupils who managed to get through the tasks were recognised. Furthermore, the feedback offered by the teacher very rarely referred to the process and individual progress, focusing, in the majority of the cases, on the final result, not fostering the students' reflections. The groupings were always free and chosen by the students, which meant that they always worked with the same companions during all the sessions, and always in small groups of two or three students.

With respect to the evaluation dimension, it was observed that there was no diagnostic evaluation, apart from the fact that the teacher always commented on the results publicly in front of all the other companions. Sometimes the evaluation contained criteria referring to progress but it mainly focused on the results obtained. The evaluation system was determined by the teacher and the students' opinion was not taken into account at any time.

Finally, referring to the time dimension, the task ended when the class ended, but they were not taken up again in subsequent sessions, even though they had not been completed.

Design and data analysis

A quasi-experimental non-equivalent control group design was used (Campbell & Stanley, 1966), because, as the research was carried out in a real education environment, the class groups were already established by the school, and randomisation cannot be respected.

The independent variable was the development of a TU within which different motivational strategies were applied in the experimental group. On the other hand, the dependent variables were the motivational climate perceived by the student (task or mastery and ego or performance climate), the BPN (autonomy, perceived competence and relatedness), self-determined situational motivation (intrinsic motivation, identified regulation, external regulation and amotivation) and affective consequences (satisfaction-enjoyment and boredom). None of the students had any previous knowledge about the content that was going to be de-

livered. As it dealt with the situational level of motivation, understood as a complete TU, a pre-test measurement could not be carried out, as all the variables studied specifically referred to the orientational content, so measuring the different motivational variables in a content that the students were not familiar with was not considered coherent. Furthermore, the study design posed two differentiated parts: the first part, which evaluated the effectiveness of the strategies developed through the possible differences found regarding motivational climate perceived by the students; and the second part, where the consequences that these differences in motivational climate might have on other motivational variables at situational level, such as BPNs, self-determined motivation, satisfaction-enjoyment and boredom, will be evaluated.

Each group had a different teacher, both of whom had experience in the PE area. In the experimental group, the teacher carried out a specific intervention, applying strategies to efficiently transmit a task-involving motivational climate. This intervention was preceded by specific training, lasting for a total of 60 hours, on the motivational theories used in the study, and also a practical application on the design of tasks and learning situations under the premises of these theories, and which were specifically developed to be applied in the orientational content. On the other hand, the control group teacher did not have any type of training, and did not specifically or consciously use or know about the intervention strategies related to the TARGET areas, so there was no type of manipulation in the control group. This other teacher used a traditional method. The differences in the interventions of both teachers can be seen more specifically in the Procedure section, developed above. The proposal of the TUs is based on the official curriculum in force (Order of 9 May 2007, BOA - Official Gazette of Aragon - of 1 June 2007). The intervention was carried out for a total of 4 double sessions lasting for 1 hour and 40 minutes and with a frequency of one weekly session.

For the data analysis, a normality analysis was initially performed that indicated the relevance of using parametric statistics. A reliability analysis was firstly performed for the different factors that comprise the instruments, via Cronbach's alpha. The descriptive results were calculated through the mean and standard deviation. A one factor (Group) MANOVA was used for the difference analyses. The effect size (η_p^2) was also calculated to evaluate the magnitude of the differences as it eliminates the size effect of the sample. The SPSS 19.0 statistical program was used in the different analyses performed.

Results

The MANOVA performed shows a main effect of the Group factor (Wilks Lambda = .784; $F(11, 101) = 2.523$; $p = .007$; $\eta_p^2 = .216$). To firstly observe the effectiveness of the intervention, the motivational climate perceived by the students at situational level was analysed. As observed in Table 1, significant differences were found in the primary factor, search for progress by the students ($F(1,111) = 5.59$, $p = .020$) and in the secondary factor, mastery climate ($F(1,111) = 5.68$, $p = .019$), with higher values in the experimental group.

Table 1. Descriptive statistics for each Group and Comparison by Pairs in the Analysis of Differences in Situational Motivational Climate.

Variables	Experimental group		Control group		Average diff.	Standard error	$F_{(1,111)}$	p	η_p^2	95% CI differences	
	M	DT	M	DT						Lower limit	Upper limit
Mastery oriented climate	4.01	(0.67)	3.74	(0.53)	.270	.113	5.68	.019	.049	.046	.494
Search for progress by Students	3.66	(0.61)	3.39	(0.56)	.265	.112	5.59	.020	.048	.043	.488
Learning promotion by teacher	4.36	(0.83)	4.09	(0.67)	.275	.141	3.77	.055	.033	-.006	.555
Execution oriented climate	3.19	(0.49)	3.09	(0.63)	.091	.111	0.67	.414	.006	-.129	.312
Search for comparison by students	3.97	(0.87)	3.74	(0.70)	.230	.149	2.37	.126	.021	-.066	.525
Fear of making mistakes	2.60	(0.86)	2.61	(0.83)	-.012	.162	0.01	.939	.001	-.333	.308

Later on, to evaluate the effect of this intervention on the rest of the situational motivational variables, the existing differences between both groups were also evaluated in terms of BPNs, self-determined motivation and affective consequences (Table 2). In this case, significant differences were found in terms of basic psychological needs in the variables of autonomy ($F(1,111) = 11.78$, $p = .001$) and perceived competence ($F(1,111) = 16.06$, $p < .001$), with higher values in the experimental group. With respect to the variables on self-determined motivation, significant differences were found in identified regulation ($F(1,111) = 6.65$, $p = .011$), with higher values in the experimental group and in amotivation ($F(1,111) = 5.83$, $p = .017$), with significantly lower values in the experimental group. Finally, with respect to the consequences, the satisfaction-enjoyment variable showed significantly higher values in the experimental group ($F(1,111) = 5.84$, $p = .017$).

Table 2. Descriptive statistics for each Group and Comparison by Pairs in the Analysis of Differences in BPNm Self-determined Motivation and Affective consequences

Variables	Experimental group		Control group		Average diff.	Standard error	F _(1,111)	p	η_p^2	95% CI differences	
	M	DT	M	DT						M	DT
Autonomy	3.30	(0.74)	2.85	(0.64)	.454	.132	11.78	.001	.096	.192	.715
Competence	3.77	(0.66)	3.28	(0.61)	.486	.121	16.06	<.001	.126	.246	.727
Relatedness	3.95	(0.80)	3.74	(0.73)	.209	.146	2.05	.155	.018	-.080	.497
Intrinsic motivation	3.27	(0.84)	2.94	(0.98)	.322	.179	3.25	.074	.028	-.032	.677
Identified regulation	3.30	(0.87)	2.88	(0.80)	.412	.160	6.65	.011	.057	.095	.728
External regulation	3.82	(0.88)	3.62	(0.87)	.197	.168	1.37	.245	.012	-.137	.531
Amotivation	2.39	(0.92)	2.84	(1.00)	-.450	.186	5.83	.017	.050	-.819	-.081
Satisfaction-Enjoyment	3.50	(0.88)	3.06	(0.98)	.437	.181	5.83	.017	.050	.079	.796
Boredom	2.40	(0.99)	2.81	(1.15)	-.407	.209	3.08	.054	.033	-.821	.007

Discussion

This study presented two basic objectives. Firstly, to verify the effectiveness of the teaching intervention at situational level, based on the TARGET areas in the orientational content; and secondly, to evaluate its effect on other motivational variables such as BPNs, self-determined motivation and affective consequences. With respect to the first hypothesis, which proposed that a teaching intervention based on the TARGET areas would reflect a greater mastery motivational climate in PE classes during the orientational content, we can state that this seems to be confirmed.

After analysing the results, we find that the experimental group, in which motivational strategies were applied, obtained a greater perceived mastery climate at situational level (i.e., orientational TU). Along this same line, other studies (Barkoukis, Tsorbatzoudis & Grouios, 2008; Cecchini et al., 2014; Cuevas, Contreras & García-Calvo, 2012; Morgan & Kingston, 2008) have shown the usefulness of manipulating the TARGET areas (Ames, 1992) to achieve an optimal motivational climate, which will be essential to optimise the motivational variables in PE and achieve more adaptive consequences. Furthermore, scientific literature has indicated through different intervention studies that the use of the TARGET areas will not only permit the generation of a task motivational climate, at certain moments, but that its use will also permit obtaining permanent effects over time (Digelidis, Papaioannou, Laparidis, & Christodoulidis, 2003; Valentini, & Rudisill, 2004). Moreover, in line with Vallerand's hierarchical model (2001, 2007) the effects found at situational level (i.e., TU) could have an influence on the contextual level (i.e., PE in general), thus highlighting the importance of carrying out specific interventions for each TU, as these will help configure the motivational processes at higher levels. However, hardly any intervention studies have been conducted that have measured the effects within the situational level of motivation in PE (Braithwaite et al., 2011), although in this study we find that the effectiveness on the motivational climate generated at situational level in the orientational content is important, so the development of specific intervention strategies for each one of the contents addressed in PE will be essential.

As a second hypothesis of the study, we proposed previously that a greater mastery motivational climate would produce greater satisfaction of the BPNs, higher levels of self-determined motivation, and greater satisfaction and enjoyment in the students, a hypothesis that we can confirm. The higher level of mastery climate perceived by the students of the experimental group, targeted by this teaching intervention, has a series of repercussions on the motivational variables established by the Self-determination Theory. Thus, as the teaching intervention generated a greater task or mastery motivational climate, there has been greater satisfaction of the basic psychological needs of autonomy and perceived competence. This is in line with previous studies (e.g., Cox & Williams, 2008; Standage et al., 2006).

On the other hand, the promotion of a mastery climate and satisfaction of the BPNs have given rise, in the experimental group, to significantly higher values in the more self-determined motivation profiles and significantly lower values in students' amotivation. These

results are in agreement with those found in the study by González-Cutre and collaborators (2011) where the intervention study, which was carried out, also represented greater intrinsic motivation as well as an increase in task motivational climate. The results obtained appear to be in line with those of other PE research studies (Moreno, Conte, Hellín, Vera & Cervelló, 2008; Moreno, Jiménez, Gil, Aspano & Torrero, 2011; Sproule, Wang, Morgan, McNeill, & McMorris, 2007), which showed that mastery motivational climate was positively and significantly related to the more self-determined forms of motivation. Likewise, other authors (Moreno, González-Cutre & Ruiz, 2009; Taylor & Ntoumanis, 2007) have shown that students who have greater self-determined motivation in PE classes, are the ones that consider that their BPNs have been more satisfied, in the same way as occurs in this research.

Furthermore, even though the BPNs of the students have been satisfied to a greater extent, obtaining higher levels of self-determined motivation, it can be observed how the students have not reached significantly higher intrinsic motivation levels. They have only obtained a significantly higher level in identified regulation, which is considered as one of the most self-determined profiles (Haerens, Vereecken, Maes, Bourdeaudhuij, 2010). This coincides with the study by Spray (2002), which points out the difficulty of developing intrinsic motivation in PE as it is a compulsory subject, and students have to participate in the classes because they have to do so, as this is determined by the educational institution.

Finally, and with respect to the affective consequences studied (satisfaction-enjoyment and boredom), the experimental group, with significantly higher values in self-determined motivation forms, shows greater perceived satisfaction-enjoyment than the control group. Similarly, the intervention study by Wallhead and Ntoumanis (2004) showed an increase in enjoyment in PE classes of the experimental group. These results appear to be in line with other previous studies that focused on affective consequences and where a strong direct relationship is observed between self-determined motivation and enjoyment (Moreno, Hernández & González-Cutre, 2009; Ryan & Deci, 2007; Taylor, Ntoumanis & Smith, 2009). Thus, it is important for students to develop self-determined motivation profiles that give rise to greater feelings of enjoyment, satisfaction and/or enjoyment during the PE classes, as this may contribute to adherence to engagement in PA and in sport by students in their leisure time (Vallerand, 2007; Yli-Piipari, Leskinen, Jaakkola & Liukkonen, 2012).

Generally speaking, the results of the study are consistent with those obtained by Papaioannou, Tsigilis and Kosmidou (2007), where mastery motivational climate resulted in greater self-determined motivation, regulated through greater satisfaction of the BPNs, and giving rise to affective consequences related to greater enjoyment during the PE classes.

Thus, the above asserts the postulates that relate the *Achievement Goal Theory* and the *Self-determination Theory* (Ciani, Sheldon, Hilpert & Easter, 2011), and which in our study has been carried out within the situational level (i.e., orientational teaching unit). In this sense, the social antecedents, which include the motivational climate generated by the teacher, has an influence on the BPNs and consequently on the level of motivation, which is more or less self-determined. All of this generates a series of consequences at affective level, such as satisfaction-enjoyment in PE classes for this specific content. Based on these results, we can highlight that the effects generated in motivation at situational level could, successively, have an effect on contextual motivation (i.e., physical education, in general) and finally, on global motivation (i.e., adopting a healthy lifestyle). Therefore, it is essential to promote a mastery motivational climate during PE classes, as this will contribute to optimising the students' motivational variables, such as situational motivation, and it may also generate more adaptive behaviours, related to healthy living habits and continued engagement in PA in free time (Jaakkola, Washington & Yli-Piipari, 2013; Yli-Piipari et al., 2012).

Despite the results obtained, this study has a series of *limitations* that must be highlighted. Firstly, the study design does not permit carrying out a pre-test as it is an evaluation within the situational level of motivation, where students had no prior experience. However, it would be possible to use contextual measures on PE that would allow for an increase in control of possible strange variables that may influence the results. Likewise, other previous measures in different TUs could be used, in order to verify if those differences found are also expressed in other contents on which there has been no intervention specifically oriented to generating a task climate.

Thus, it has been shown how the TARGET areas (Ames, 1992) are a useful and efficient resource that PE teachers possess to design and apply motivational strategies that foster a mastery climate in the orientational content. This study has dealt with a very small part of the extensive and complex relationship of motivational variables that exist in PE. It has also focused on one single content, of the many different options that exist in the official curricu-

lum in force, pursuant to Order of 9 May 2007 (BOA of 1 June 2007; Aragon, Spain). Thus a future study line is established to see how they can affect other variables that have not been included in the study (e.g., autonomy support, dispositional orientation or PA engagement habits) and evaluate the effect of interventions at situational level on variables at a contextual or global level. Furthermore, it would be interesting to develop strategies that can be applied in other contents or areas of physical-sport activities, since, as Cervelló, Iglesias, Moreno, Jiménez and Del Villar (2004) point out, PE teachers usually show a stable determination style of motivational climate in the different PE contents, which suggests the need to develop training programmes so that teachers generate an optimal motivational climate in PE classes. Finally, another aspect that can optimise this type of research would be the use of digital support and observational methodology to be able to establish detailed differences in terms of the application of strategies, as well as their frequency and intensity, and re-orientate the teaching intervention in a more efficient manner.

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