Physical Education Lessons and Physical Activity Intentions within Spanish Secondary Schools: A Self-Determination Perspective

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Abstract

Grounded in Self-Determination Theory, the purpose of this study was to analyze how motivational processes within Physical Education classes can predict intention to participate in sport or physical activity outside of the school curriculum. Participants included 1,692 Spanish students aged 12 to 16 years (M = 13.34; SD = .76) who participated in Physical Education lessons at 32 secondary schools. Structural equation modeling was used for analysis, and showed that perception of basic psychological need (BPN) support from teachers predicted autonomous and controlled motivation through BPN satisfaction. Furthermore, autonomous motivation positively predicted enjoyment, perceived importance of Physical Education, and intention to participate in sport or physical activity outside of school. Controlled motivation negatively predicted enjoyment, and amotivation positively predicted boredom. Finally, enjoyment and perceived importance of Physical Education positively predicted intention to participate in sport or physical activity outside of what was required in school. Results emphasize the importance of school based Physical Education to promote sport and physical activity participation among adolescents.

Keywords: teaching, motivation, adolescents, physical education.

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Low levels of youth participation in physical activity[1] is one of the major issues of the XXI century (Bouchard, Blair, & Haskell, 2012). Physical inactivity is known to increase the risk of non-communicable diseases (e.g., obesity, diabetes and heart diseases), while engaging in regular physical activity is widely associated with a decrease in the risk factors of such non-communicable diseases (Ekelund et al., 2012). Many studies have identified Physical Education classes as an appropriate tool through which to promote physical activity in youth, and thus, improve overall health (Fairclough & Stratton, 2005; Sallis et al., 2012).

In Spain, during a typical week, students will participate in two hours of compulsory Physical Education classes. This is the only compulsory physical activity during school hours. Consequently, if adolescents want to participate in extracurricular physical activity, they are independently required to enroll in organized activities (e.g., sport clubs). In order to encourage physical activity outside of school once the individual has completed their secondary education, it is important for Physical Education teachers to promote enjoyment and interest towards physical activity of students through the activities developed in the classes. Hence, this is why students' motivation has been investigated and empirically demonstrated to be an important aspect in promoting extracurricular sport participation (Barkoukis, Hagger, Lambropoulos, & Tsorbatzoudis, 2010; Chatzisarantis & Hagger, 2009; Hagger et al., 2009; Ntoumanis, 2005).

This study aimed to investigate the influence of Physical Education classes on intention to participate in extracurricular physical activity in Spanish adolescents. More specifically, the study examined the importance of motivation in predicting pertinent outcomes, such as, enjoyment, boredom and perceived importance of Physical Education, all

[1] When we refer to physical activity throughout this document, we are including sport, leisure time physical activity and group sport as part of the term.

within the Physical Education context, and assessing their influence on the intention to participate in physical activity outside of the school curriculum.

Support for Self-Determination Theory in the Context of Physical Education

Motivational processes are best understood within theoretical frameworks. Self-Determination Theory (SDT; Deci & Ryan, 1985; Ryan & Deci, 2000), a macro theory of motivation, is a theoretical framework that has been used to help understand motivation within the context of Physical Education (Ntoumanis & Standage, 2009; Van den Berghe, Vansteenkiste, Cardon, Kirk, & Haerens, in press). SDT theorists propose that motivation lies along a continuum and distinguish three types of behavioral regulation, which are associated with varying degrees of self-determined motivation; autonomous motivation, controlled motivation and amotivation (Ryan & Deci, 2000; Vansteenkiste, Niemiec, & Soenens, 2010).

According to SDT (Ryan & Deci, 2000), *autonomous motivation* is the highest degree of self-determined motivation along the continuum, and is formed by two types of regulation: intrinsic regulation (engagement in activities for the feelings of enjoyment, pleasure, interest, and satisfaction as a result of the participation itself) and identified regulation, which is perceived to be an autonomous form of external motivation (understanding and putting value on an activity, and the outcomes associated with the activity). In contrast, SDT posits that *controlled motivation* comprises of two behavioral regulations: introjected regulation (engagement in an activity to avoid feelings of guilt and shame, or to achieve feelings related with personal ego, such as pride) and external regulation (behaviors controlled by contingencies external to the individual, such as obtain rewards, avoid punishments, or meet external expectations). Finally, the third category of motivation is referred to as *amotivation*, and represents the absence of motivation, either intrinsic or extrinsic (engaging in an activity without intention and volition).

Central to SDT is the concept that self-determined motivation is determined by the satisfaction of three basic psychological needs (BPN): autonomy, competence and relatedness (Deci & Ryan, 2000). *Autonomy satisfaction* is a need for feelings of volition and free will; the sense that the individual has personal control of his or her own life. *Competence satisfaction* refers to the need to effectively carry out a behavior to achieve a desired outcome and the ability to handle situational demand. Lastly, *relatedness satisfaction* refers to the need to interact, feel connected to, and accepted by significant others (Deci & Ryan, 2000). Findings of numerous studies, within the context of Physical Education, have shown that students who perceive high levels of need satisfaction develop more self-determined motivation within their Physical Education classes (Rutten, Boen, & Seghers, 2012; Standage, Duda, & Ntoumanis, 2005; Zhang, Solmon, Kosma, Carson, & Gu, 2011).

The Hierarchical Model of Motivation (Figure 1; Vallerand, 2007) can be applied to explain the dynamic motivational process posited by SDT in a variety of contexts (sport, physical education, work place). Within Physical Education, the model explains how socio-contextual variables (e.g., teachers' interpersonal style) can influence the students' BPN satisfaction and consequently their quality of motivation, and how the different types of motivational regulation can predict positive or negative cognitive, affective, and behavioral outcomes. Specifically, findings have demonstrated that self-determined motivation predicted increased levels of positive outcomes, such as enjoyment, perceived importance of Physical Education and intention to participate in sport and physical activity (Gråstén, Jaakkola, Liukkonen, Watt, & Yli-Piipari, 2012; Lim & Wang, 2009; Ntoumanis, 2005; Standage, Duda, & Ntoumanis, 2003; Standage et al., 2005; Taylor, Ntoumanis, Standage, & Spray, 2010), whereas less self-determined motivation were predictors of more negative outcomes, such as boredom (Ntoumanis, 2001).

Research regarding socio-contextual factors (e.g., teachers' interpersonal style), which could play a role in influencing students' motivation through the satisfaction of the three BPN, (Haerens et al., 2013; Standage et al., 2005; Tessier, Sarrazin, & Ntoumanis, 2010), highlights that independently autonomy, competence and relatedness support are central variables in the promotion of basic need satisfaction. Firstly, *autonomy support* refers to the behavior of an individual in a position of authority (e.g., a teacher). If the teacher allows freedom of expression and action, and encourages students to attend, accept, and value their inner states, preferences and desires, he/she is providing autonomy support (Reeve, 2009). Secondly, *competence support* refers to the ability of a teacher to communicate information regularly to his or her students in order to guide their performance, to promote their sense of confidence and to achieve the aims proposed (Skinner & Belmont, 1993). Finally, *relatedness support* refers to the teacher acting in a way that encourages inclusion and integration of classmates (Skinner & Belmont, 1993). Although the theoretical proposition of SDT (Ryan & Deci, 2000) suggests a multifaceted environment to promote the BPN satisfaction, previous research has predominantly used a unifaceted approach and has often focused on solely assessing the effects of autonomy support (Su & Reeve, 2010), thus avoiding the independent assessment of a learning environment that could promote the competence and relatedness need satisfaction. Only two studies (Standage et al., 2005; Zhang et al., 2011), to our knowledge, have tested Vallerand's model of motivation in the context of Physical Education examining a multifaceted social environment (autonomy support, competence support and relatedness support from the Physical Education teacher).

Standage and colleagues (2005) used structural equation modeling (SEM) to analyze data from 950 students and revealed that BPN support provided by Physical Education teachers positively predicted student needs satisfaction. This, in turn, positively predicted intrinsic motivation and introjected regulation and, negatively predicted external regulation

and amotivation. Furthermore, intrinsic motivation was associated with positive outcomes (concentration, positive affect and task challenge) and amotivation was associated with feelings of unhappiness. However, the authors of the study only examined the outcomes and consequences within the context of the Physical Education class, and did not consider extracurricular outcomes (e.g., intention to be physically active, physical activity levels). Similarly, using a sample of 286 middle school students, Zhang et al. (2011) findings supported the notion that teachers' BPN support can influence intrinsic motivation via students' BPN satisfaction. The results of this study showed that intrinsic motivation positively predicted students' levels of physical activity within and beyond school settings. This study however, had two limitations. First, the authors only assessed intrinsic motivation, and therefore the other types of regulation were not considered. Second, the study only measured one behavioral outcome (levels of physical activity). Outcomes within the context of Physical Education were not examined.

The present study

In sum, there is a paucity of literature that aims to examine socio-contextual factors in the context of Physical Education from a multifaceted perspective. Thus, further research is needed to test the importance of motivational antecedent to explain different Physical Education outcomes and to analyze how these variables can predict physical activity adherence beyond participation during school hours. Thus, in line with suggestions indicated by Van den Berghe et al. (in press), this study adds to the extant literature by testing the three characteristics of need-supportive environments proposed by SDT theorists (autonomy support, competence support and relatedness support), independently, as important antecedents of BPN and quality of motivation within a Physical Education lesson. Furthermore, we tested specific variables measuring student's perceptions and attitude within Physical Education classes (enjoyment, boredom and perceived importance of Physical

Education) and assessed how these variables may influence and predict intention to participate in extracurricular sport and physical activity outside Physical Education classes.

The overarching purpose of this study was to test Vallerand's model of motivation (Vallerand, 2007) within Physical Education classes, and therefore to examine the relationship between students' perception of BPN support from Physical Education teachers, students' perceived BPN satisfaction, quality of motivation and outcomes (enjoyment, boredom and perceived importance of Physical Education), and to test the influence of these variables on intention to participate in sport and physical activity. More specifically, it was hypothesized that: (a) Students' perception of BPN support from Physical Education teachers (autonomy, competence and relatedness support) would positively predict students' BPN satisfaction (autonomy, competence and relatedness satisfaction); (b) BPN satisfaction would positively predict autonomous motivation and negatively predict amotivation; (c) Autonomous motivation would emerge as a positive predictor of enjoyment and perceived importance of Physical Education and a negative predictor of boredom, and (d) amotivation would positively predict boredom but negatively predict enjoyment and perceived importance of Physical Education; (e) Autonomous motivation, enjoyment and perceived importance of Physical Education would positively predict intention to participate in sport, while amotivation and boredom would be negative predictors of these variables.

Method

Participants

Following approval by the Ethical Review Committee of a Spanish University, 1692 students (851 males, 839 females, 2 did not specify their gender) aged between 12 to 16 years (M_{age} = 13.34 years; *SD* = .76) were recruited from 83 school classes within 32 randomly selected public elementary schools situated in western Spain. The population was selected by multi-step, simple random sampling, first taking into account the population from

Extremadura (Spain) and then by random assignment of each school. Schools were chosen according commitment to participate in the present study and their geographical location in the region (north–south gradient in order to be representative).

Measures

Perceived need support. Perceived autonomy, competence, and relatedness support were assessed using the Questionnaire of Basic Psychological Needs Support in Physical Education (Sánchez-Oliva, Leo, Amado, Cuevas, & García-Calvo, 2013). Students responded to the statement, "*In Physical Education classes, my teacher…*" by rating 12 items. Four items represented each of the basic psychological needs support: autonomy support (e.g., "...often asks us about our preferences with respect to the activities we carry out"), competence support (e.g., "...offers us activities based on our skill level."), and relatedness support (e.g., "...promotes good relationships between classmates at all times."). Participants responded using a 5-point Likert-like scale anchored by 1 (strongly disagree) to 5 (strongly agree). Fit indices from confirmatory factorial analysis (CFA) indicated an acceptable fit of the model to the data: $\chi^2/df = 3.22$; *CFI*= .96; *TLI* = .96; *GFI* = .95; *SRMR* = .04 and *RMSEA* = .05. Internal reliability analyses showed acceptable alpha Cronbach values of .79 for autonomy support, .77 for competence support, and .78 for relatedness support.

Perceived need satisfaction. The Spanish adaptation of the Basic Psychological Needs in Exercise Scale (BPNES: Vlachopoulos & Michailidou, 2006), specific for the context of physical education (Moreno, Gonzalez-Cutre, Chillon, & Parra, 2008) was used to asses perceived need satisfaction of the students. Participants responded to the statement "*In my* Physical Education *classes*..." by rating 12 items on a 5-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). Four items represented each of the basic psychological needs: autonomy (e.g., "...we carry out exercises that are of interest to me"), competence (e.g., "...I carry out the exercises effectively), and relatedness (e.g., "...my

relationship with my classmates is friendly"). Scores from these three subscales were used as indicators for the latent factor need satisfaction. Fit indices from the CFA were acceptable: χ^2/df = 2.67; *CFI*= .97; *TLI* = .97; *GFI* = .96; *SRMR* = .05 and *RMSEA* = .06. Cronbach's alpha values showed acceptable internal reliability: .82 for autonomy satisfaction, .80 for competence satisfaction and .78 for relatedness satisfaction. Further, previous studies demonstrated the internal reliability of the instrument (Cecchini, Fernández-Losa, González, & Cecchini, 2013; Ferriz, Sicilia, & Sáenz-Álvarez, 2013).

Motivation. The different types of behavioral regulations (amotivation, external regulation, introjected regulation, identified regulation and intrinsic motivation) were assessed using the Questionnaire of Motivation in Physical Education Classes (CMEF: Sánchez-Oliva, Amado, Leo, González-Ponce, & García-Calvo, 2012). The questionnaire contained 20 items (4 items per behavioral regulation) that followed the statement "I take part in this Physical Education class...": intrinsic motivation (e.g., "Because Physical Education is fun"), identified regulation (e.g., "Because I can learn skills that could be used in other areas of my life), introjected regulation (e.g., "Because I feel bad if I am not involved in the activities"), external regulation (e.g., "Because I want the teacher to think that I am a good student") and amotivation (e.g., "But I think that I'm wasting my time with this subject"). Items were rated on a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree). The model fit indexes from the CFA were all acceptable: χ^2/df = 2.87; *CFI*= .96; *TLI* = .95; *GFI* = .95; *SRMR* = .04 and *RMSEA* = .05. Furthermore, Cronbach's alpha values were deemed acceptable: .82 for intrinsic motivation, .81 for identified regulation, .77 for introjected regulation, .80 for external regulation and .87 for amotivation.

Enjoyment and boredom. The Enjoyment/Boredom in Sport Scale (Duda & Nicholls, 1992) adapted by Baena-Extremera, Granero-Gallegos, Bracho-Amador, and Pérez-Quero (2012) for the Spanish language on Physical Education context, was administered to measure

enjoyment and boredom within the Physical Education classes. This questionnaire included 6 items: 3 items for enjoyment (e.g., "I usually enjoy Physical Education") and 3 items for boredom (e.g., "In Physical Education, I usually wish the class would end quickly"). Responses were given on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The model fit indexes from the CFA were acceptable: $\chi^2/df = 1.79$; *CFI*= .99; *TLI* = .99; *GFI* = .99; *SRMR* = .01 and *RMSEA* = .02. Cronbach's alpha coefficients have previously shown internal reliability: .86 for enjoyment and .90 for boredom. Also, previous studies demonstrated the internal reliability of the instrument (Ferriz et al., 2013; Granero-Gallegos, Baena-Extremera, Pérez-Quero, Ortíz-Camacho, & Bracho-Amador, 2012).

Perceived importance of physical education. The Perceived Importance of Physical Education Scale (PIPE: Moreno, González-Cutre, & Ruiz, 2009) was used to assess the importance of Physical Education lessons from the perspective of the students. The scale includes three items (e.g., "I think it is important to receive physical education classes"), that were rated on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The model fit indexes from the CFA were acceptable: $\chi^2/df = 2.46$; *CFI*= .92; *TLI* = .91; *GFI* = .92; *SRMR* = .05 and *RMSEA* = .06. Further, Cronbach's alpha value was .76. Further, previous studies demonstrated the internal reliability of the instrument (Granero-Gallegos et al., 2012; Moreno-Murcia, Zomeño, De Oliveira, Ruiz, & Cervelló., 2013).

Intention to be physically active. One item was included to measure students' intention to participate in physical activity outside of the school curriculum: "In the coming years, I intend to participate in sport/ physical activity". The questionnaire specified that "sport participation" refferred to participating in physical activity or a sport on a regular basis (at least twice a week). Participants responded using a 5-point Likert scale anchored by 1 (strongly disagree) to 5 (strongly agree). Previous research has implemented single-item scales effectively (Ntoumanis, 2001; Shen, in press).

Procedure

The present study was supported by the Spanish Professional Association of Physical Education teachers, which enabled us to initiate contact with the participating students. Each head teacher provided the research team with a letter of consent agreeing for the school to participate in the study. Physical Education teachers were contacted and informed that the purpose of the study was to obtain information regarding the students' experiences and motivation during their Physical Education lessons. Parental consent was also obtained for all participants before commencing the study. Prior to the data collection, an explanation of each item was given to the teachers to avoid any confusion when the students completed the questionnaire. All questionnaires were completed in the classroom environment before each lesson began. Questionnaires were completed online via Google Doc Software[2], which participants could access via a link provided by the researchers[3]. Physical Education teachers emphasized to the students that completion of the questionnaire was voluntary, that their responses would remain anonymous, and that they should answer honestly regarding their feelings toward Physical Education. The questionnaires took approximately 25-30 minutes to complete.

Data analysis

The Statistical Package of the Social Sciences (SPSS 18.0) was used to obtain descriptive statistics and internal consistency reliability estimates for all study variables. At this time, Confirmatory Factor Analyses (CFA) were also conducted on the study questionnaires to test the psychometric properties, using version 18.0 of the statistical

[2] Google Doc is a software that allows users to create online surveys. Once the questionnaire is created, a URL is created for students to access the questionnaire. Once the student has completed the questionnaire, the data is stored in an excel document, and can be accessed only by the administrator. This program was deemed suitable as it allows multiple students to complete the questionnaire at the same time.

[3] In Spain, all schools provide each student with their own computer with internet connection.

program AMOS. Following this, we used Structural Equation Modeling (SEM) with maximum likelihood estimation to address the main purpose of the study.

Using SEM techniques, we initially evaluated the multivariate normality of the data using Mardia's multivariate kurtosis coefficient. First, the measurement model was examined to assess the relationships between the observed indicators and their respective latent constructs. Scores from the subscales were used as indicators for the latent factor need support, need satisfaction, autonomous motivation and controlled motivation. For amotivation, enjoyment, boredom and importance of Physical Education, we randomly created parcels of two items to form two indicators, serving as indicators for each respective latent variable. Using parcels provided advantages by obtaining a parsimonious model when reducing parameters, and by reducing probability that the residuals would be correlated. This increased the reliability of indicators (Coffman & MacCallum, 2005).

Model fit was examined using the chi-square statistic: x^2 value, the Goodness-of-Fit Index (GFI), the Comparative Fit Index (CFI), root mean square error of approximation (RMSEA) and Standardized Root Mean-square Residual (SRMR). A non-significant χ^2 value indicates that the specified model is not significantly different from the data and thus a good fit. Hu and Bentler (1995) proposed that values of .90 or greater for both the CFI and GFI and values of (or less) than .08 and .06 for the SRMR and RMSEA, respectively, are indicative of good model fit (Browne & Cudeck, 1993).

Results

Descriptive Analysis and Scale Reliability

Descriptive statistics and internal reliability coefficients (Cronbach's alpha) are presented in Table 1. The participants' mean scores were above the midpoint for all variables with the exception of amotivation. Self-report measures showed acceptable levels of reliability, exceeding Nunnally's (1978) criterion of .70.

Structural Equation Modeling Analysis

Initially, we used a two-step model-building (Anderson & Gerbing, 1988) to explore the appropriateness of the proposed model (Figure 2). A confirmatory factor analysis was carried out to test the measurement model in step 1. As the Mardia coefficient was large (87.32), we used the maximum likelihood estimation method in conjunction with the bootstrapping procedure. Therefore, the estimators were not affected by the lack of normality and, consequently, were considered sufficiently robust (Byrne, 2001). The fit indices indicated that the measurement model adequately described the data: $\chi^2/df = 6.88$; *CFI*= .95; *TLI* = .93; *GFI* = .92; *SRMR* = .05 and *RMSEA* = .06. The regression weights between items and latent variables ranged between .61 and .79.

For the second step we used Structural Equation Modeling (SEM) to analyze the relationship between the study variables. In line with Vallerand's model of motivation (Vallerand, 2007), we included socio-contextual factors (BPN support), mediators (BPN satisfaction), quality of motivation (autonomous motivation, controlled motivation and amotivation) and outcomes (enjoyment, boredom, perceived importance of Physical Education and intention to participate in sport and physical activity). We used maximum likelihood estimation method to test the SEM. Mardia's multivariate coefficient indicated data distribution to be non-normal (87.53), and therefore, we used bootstrapping (Byrne, 2001). A covariance matrix was used as the input for the whole model. Results of the SEM analysis revealed that the model was a good fit to the data: $\chi^2/df = 8.88$; *CFI*= .93; *TLI* = .91; *GFI* = .92; *SRMR* = .06; *RMSEA* = .04.

Figure 2 shows the standardized results of the model. Perceptions of BPN support was a strong positive predictor of BPN satisfaction. In turn, BPN satisfaction positively predicted intrinsic motivation. Furthermore, autonomous motivation positively predicted enjoyment and perceived importance of Physical Education, and controlled motivation negatively

predicted enjoyment. Amotivation positively predicted boredom, and was a strong predictor of enjoyment. Finally, enjoyment and perceived importance of Physical Education appeared as positive predictors of intention to participate in sport or physical activity outside of school.

The standardized indirect effects revealed that BPN support had positive effects on autonomous motivation (β = .76), controlled motivation (β = .58), enjoyment (β = .69), perceived importance of Physical Education (β = .72) and intention to participate in sport (β = .45) through BPN satisfaction. BPN satisfaction had positive indirect effects through the motivational regulations on enjoyment (β = .86), perceived importance of Physical Education (β = .88) and intention to participate in sport (β = .55). Finally, autonomous motivation had a positive indirect effect through enjoyment, boredom and perceived importance of Physical Education on intention to participate in physical activity and sport outside of school (β = .69).

Discussion

The purpose of this study was to test the hierarchical model of motivation (Vallerand, 2007) within the context of Physical Education. More specifically, we aimed to analyze students' motivational processes to determine enjoyment, boredom and perceived importance of Physical Education. Furthermore, we aimed to explore how these variables influence the intention to participate in extracurricular physical activity. The results revealed that BPN support predicted self-determined motivation through satisfaction of BPN, while the quality of motivation predicted the intention to participate in physical activity through enjoyment, boredom and perceived importance of Physical Education.

Firstly, the results revealed the importance of the learning environment created by the Physical Education teacher. Specifically, our model indicated that BPN support is an important predictor of overall BPN satisfaction. Furthermore, indirect effects emphasized BPN support as a significant positive predictor of the three basic psychological needs (autonomy, competence and relatedness satisfaction). These results support the first

hypothesis and are consistent with Vallerand's model and outcomes of extant research (Rutten et al., 2012; Standage et al., 2005; Zhang et al., 2011). Findings emphasize that students who perceived support of all three needs (autonomy, competence and relatedness) were the same students who revealed greater satisfaction of the needs of autonomy, competence and relatedness.

Findings also showed that BPN support positively predicted autonomous motivation, controlled motivation, enjoyment, perceived importance of Physical Education, and intention to participate in physical activity. Previous research has indicated that BPN support can predict self-determined motivation, positive affect and physical activity (Rutten et al., 2012; Standage et al., 2005; Zhang et al., 2011). Hence, it is important to emphasize the teachers´ role in promoting a learning environment to facilitate autonomy, competence and relatedness satisfaction. In order to increase students' perception of autonomy, it appears vital that the teacher facilitates activities where the students have some freedom of decision and their particular interests are considered. In order to improve perception of competence, tasks should be tailored to the level and ability of the student. Teachers could provide this by giving positive feedback and sufficient time to achieve the aims planned. Lastly, in order to promote students' perception of relatedness, it would be beneficial to propose group activities and encourage cooperative learning.

More specifically, autonomy support can encourage students to feel a greater sense of control, and help them to feel that they are the origin of their own behaviors, leading to the internalization of motivation, and thus, increasing levels of self-determination (Reeve, 2009). Furthermore, if the teacher includes tasks optimizing students` competence support, he/she will be significantly contributing to students making a greater effort to learn and improve, optimizing his/her perception of their own ability and facilitating a more self-determined motivation (Jang, Reeve, & Deci, 2010). The feelings of connectedness among the students

and peers are likely to improve within an environment where the teacher attempts to support a student's need for relatedness. Importantly, these factors would lead to increased levels of confidence among classmates, which in turn could help students to overcome the fear of not being able to achieve (i.e., fear of failure) and therefore increase the feeling that they belong to the group (relatedness) (Tessier et al., 2010). In sum, the current findings suggest and re-affirm that the satisfaction of the three basic psychological needs through BPN support is key to promoting self-determined motivation, and consequently, encouraging positive outcomes within the context of Physical Education.

Our results show that BPN satisfaction positively predicted controlled motivation. Students who perceive levels of autonomy, competence and relatedness can develop controlled types of regulation (e.g., feelings of guilt). However, there is a paucity of research that examines the relationships between these variables. The majority of research has focused on assessing intrinsic motivation or has grouped the behavioral regulations into a single score (e.g., SDI) (Ommundsen & Kvalo, 2007; Rutten et al., 2012; Standage, Duda, & Ntoumanis, 2006; Zhang et al., 2011). Standage et al. (2003), for example, showed how autonomy and relatedness satisfaction positively predicted introjected regulation, and later found (Standage et al., 2005) that overall BPN satisfaction was a positive predictor of introjected regulation and a negative predictor of external regulation. Further research is therefore required to better understand the relationship between BPN satisfaction and non self determined regulations.

Amotivation was not negatively predicted by the satisfaction of BPN and therefore we cannot accept the hypothesis regarding the relationship between BPN satisfaction and amotivation. These results are not consistent with findings of Standage et al. (2005), where BPN satisfaction was found to be a negative predictor of amotivation. Taking into account the cross-sectional nature of this study, content taught in the weeks prior to data collection (football, basketball, volleyball, handball…) may be the reason for the differences in the

results of this study compared to those found by Standage et al. (2005). Therefore, future research may consider including variables that have previously been shown to be positive predictors of amotivation (e.g., controlling for socio-contextual factors and psychological need thwarting) (Bartholomew, Ntoumanis, Ryan, Bosch, & Thøgersen-Ntoumani, 2011), and also assessing the prediction capacity of mal-adaptive outcomes (e.g., boredom).

The current model analyzed the relationship between quality of motivation and various outcomes. Autonomous motivation positively predicted enjoyment and perceived importance of Physical Education. SDT theorists (Deci & Ryan, 2000) posit that intrinsic reasons for engaging in a behavior are related to satisfaction, pleasure, happiness or fun, and primarily enjoyment. Therefore, it is reasonable to suggest that students who placed a greater importance on the Physical Education classes, revealed such feelings. Previous research has shown that self determined motivation was a positive predictor of enjoyment (Gråstén et al., 2012; Ommundsen & Kvalo, 2007; Zhang, 2009) and perceived importance of Physical Education (Moreno-Murcia et al., 2013). Indirect effects also revealed autonomous motivation as a positive predictor of intention to participate in sport. These results are consistent with previous studies (Lim & Wang, 2009; Ntoumanis, 2005; Standage et al., 2003; Taylor et al., 2010), emphasizing the importance of Physical Education motivation on physical activity levels outside of school.

However, there are only few studies that have demonstrated the negative consequences of low levels of self-determined motivation. In the current study, controlled motivation negatively predicted enjoyment, whereas amotivation positively predicted boredom. According to Deci and Ryan (2000), students who experience motivation often experience low perceived ability, which could feasibly lead to boredom among the students. Furthermore, current findings showed that amotivation negatively predicted enjoyment and perceived importance of Physical Education, but regression weights were non-significant ($p >$

.05). These results could be a consequence of the characteristics of Physical Education as a school subject. In Physical Education classes, students participate in different activities (e.g., football, basketball, handball, tennis, etc.), and can become more or less motivated and experience a different quality of motivation towards one activity over another. That is, referring to the up-down effects between levels, as indicated by Vallerand's model (Vallerand, 2007), situational motivation of students in the sessions prior to data collection can affect contextual motivation toward physical education. It is possible that some students were not motivated in the activities within Physical Education classes, but still had the intention to participate in an activity that was not included in the curriculum outside of the school Physical Education lessons.

Lastly, our model revealed that enjoyment and perceived importance of Physical Education were strong predictors of intention to participate in physical activity. These results support the findings of Moreno-Murcia, Huescar and Cervelló (2012), who demonstrated the importance of positive perception of Physical Education classes (specifically the type of motivation, enjoyment and importance) in promoting the maintenance of physical activity in adolescents which in turn, could reduce the levels of sedentary behaviors within schools (Sallis et al., 2012).

Overall, results showed the suitability of Vallerand's model to explain the motivational processes in the context of Physical Education, emphasizing the importance of social-contextual factors relating to the teacher promoting BPN satisfaction, increasing self-determined motivation, and consequently achieving adaptive responses (e.g., adherence to participate in extracurricular physical activity). It is therefore relevant for Physical Education teachers to facilitate self-determined motivation as part of their teaching in Physical Education lessons by implementing strategies to create a learning environment that supports autonomy, competence and relatedness perception (Tessier et al., 2010).

Although the current findings reveal interesting outcomes regarding the importance of Physical Education in promoting physical activity participation, further research should address the limitations of this study. For example, the current research examines students' intention to participate in physical activity in the years that follow their secondary schooling. Longitudinal studies would give a more objective view of the relationship between motivational processes regarding Physical Education and physical activity levels over time.

From a methods point of view, although a single item questionnaire can reduce participant burden and has previously been implemented successfully (Ntoumanis, 2001; Shen, in press), the use of one item to measure students' intentions is a limitation of the study. Interpretations of the results indicate that future research should include variables to analyze the negative aspects of the BPN. For example, there is a need to investigate how a teachers´ controlling style can influence needs thwarting within the Physical Education classes (Bartholomew et al., 2011). Although we examined the influence of the environment created by the teacher, future research could also consider the importance of need support from a significant other (e.g., parents or peers) in relation to physical activity levels.

In conclusion, this study has demonstrated the importance of Physical Education in promoting a physically active lifestyle. More specifically, motivational processes developed by students play an important role in the perceptions and attitude within the Physical Education lesson, and consequently, in the intention to participate in extracurricular physical activity following secondary schooling. Physical Education teachers therefore play a vital role in creating teaching environments to facilitate the satisfaction of the student's BPN. This is a context which should be considered for the implementation of intervention programs where Physical Education teachers provide strategies for autonomy, competence and relatedness support (Aelterman et al., 2013; Tessier et al., 2010). By testing the perceived importance of Physical Education in promoting adherence to physical activity participation

and taking into account the sedentary levels within the school age population, findings can be used to inform Spanish public policy when developing school curricula in the context of Physical Education (e.g., providing need supportive training for teachers), to improve attitude and regular physical activity participation.

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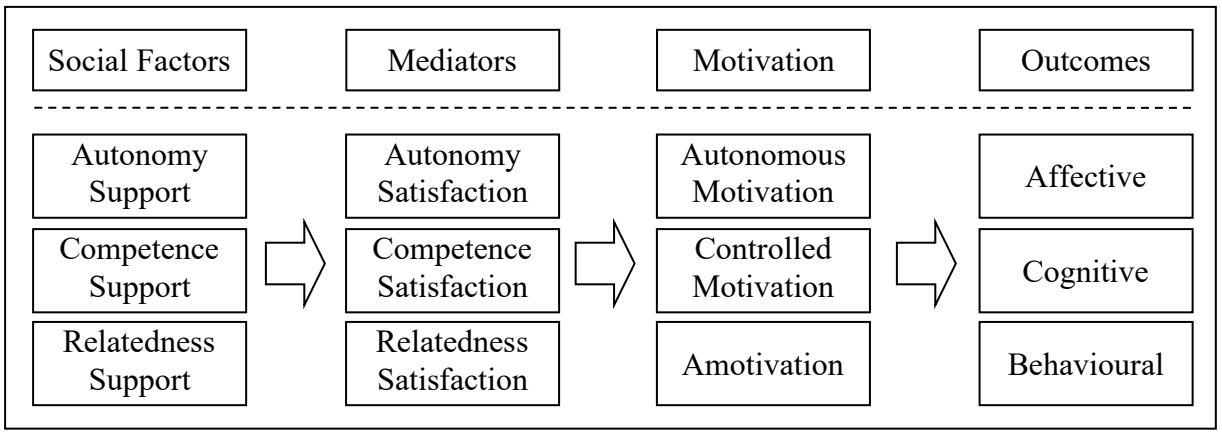

Figure 1. The Hierarchical Model of Motivation (adapted from Vallerand, 2007).

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Table 1.

Descriptive statistics and internal consistency among the study variables.

Variables	Mean	*SD*	Skewness	Kurtosis	α
Autonomy Support	3.97	.91	-.92	.51	.79
Competence Support	4.51	.65	-1.72	1.40	.77
Relatedness Support	4.41	.70	-1.37	1.84	.81
Autonomy Satisfaction	3.82	.93	-.63	-.11	.82
Competence Satisfaction	4.15	.78	-.97	.89	.80
Relatedness Satisfaction	4.39	.70	-1.32	1.65	.78
Intrinsic Motivation	4.31	.79	-1.44	2.14	.82
Identified Regulation	4.24	.79	-1.21	1.35	.81
Introjected Regulation	3.60	1.10	-.54	-.54	.77
External Regulation	3.84	1.03	-.80	-.10	.80
Amotivation	2.33	1.36	.72	-.83	.87
Enjoyment	4.36	.85	-1.58	2.43	.86
Boredom	2.55	1.46	.47	-1.22	.90
Importance of Physical Education	4.13	.87	-1.11	.99	.76
Intention	4.24	1.09	-1.44	1.32	-

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Table 2.

Indirect Effects.

	Effect
BPN Support → Autonomous Motivation	.76**
BPN Support → Controlled Motivation	.58**
BPN Support → Amotivation	.08
BPN Support → Enjoyment	.69**
BPN Support → Boredom	.02
BPN Support → Importance of PE	.72**
BPN Support → Intention	.45**
BPN Satisfaction → Enjoyment	.86**
BPN Satisfaction → Boredom	.03
BPN Satisfaction → Importance of Physical Education	.88**
BPN Satisfaction → Intention	.55**
Autonomous Motivation → Intention	.69**
Controlled Motivation → Intention	-.12*
Amotivation → Intention	-.02

* $p < .05$; ** $p < .01$

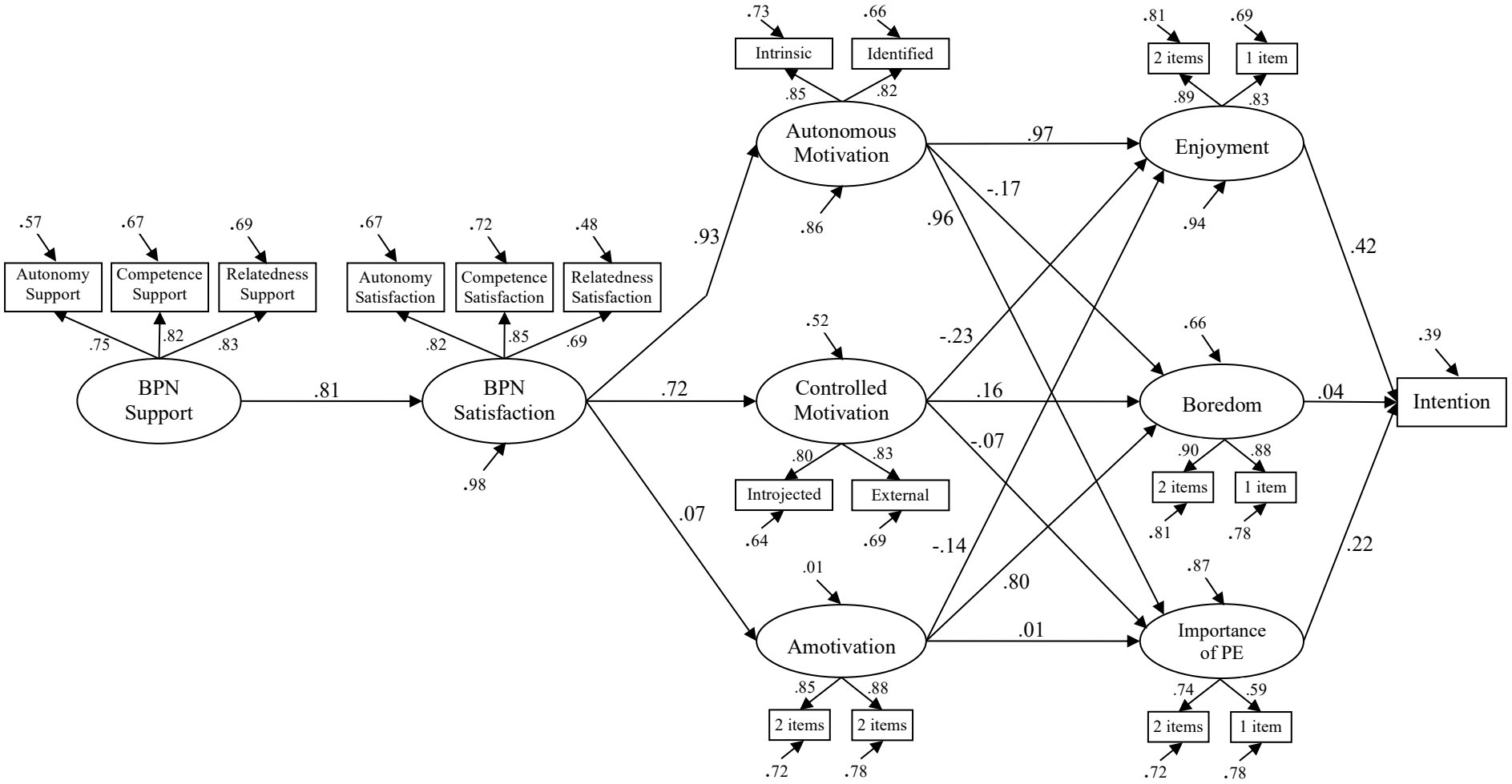

Figure 2. Structural Equation Model. All standardized estimates $\beta > .18$ are significant ($p < .05$).