

Motivational orientation, boredom and fun in physical education: The mediation role of self-esteem and motor self-efficacy

Abstract

Adolescents who enjoy physical education (PE) classes are more likely to be active during out-of-school hours. Similarly, achievement goal theory suggests that task-oriented motivation is associated with higher levels of reported fun during PE classes. In contrast, ego-oriented motivation has been related to boredom in class, but some self-perceptions (e.g., self-esteem or motoric self-efficacy) may modify this relationship and are important for physical activity. Thus, models for analyzing relationships between motivational orientation and fun or boredom should consider these research findings. Our aim in this paper was to analyze the relationship between motivational orientation and fun and boredom in PE classes by assessing the mediating effects of self-esteem and self-efficacy. We surveyed 478 teenagers between 13 and 18 years of age ($M= 14.57$; $SD= 1.15$) with the Task and Ego Orientation in Sport Questionnaire (TEOSQ), the Rosenberg Self-Esteem Scale (RSE), the Motor Self-Efficacy Scale (MSES), and the Intrinsic Satisfaction in Sport Scale (SSI-EF). We used a structural equation model to evaluate relationships between variables of interest. We found a positive relationship between ego orientation and boredom and between task orientation and fun and a negative relationship between task orientation and boredom in PE classes. Importantly, we observed indirect effects from self-esteem and motoric self-efficacy in the relationship observed between motivational orientation and boredom and fun in PE. These results highlight the importance of students' motivational orientation in PE classes and illustrate that self-perception of self-esteem and motoric self-efficacy can mediate these relationships. Thus, motivational factors as well as self-esteem and self-efficacy) must be considered in PE.

Keywords: Physical Education; Self-esteem; Motor Self-efficacy, Lifestyle.

Introduction

Getting students to enjoy themselves should be a main objective in Physical Education (PE) classes, not only because it makes schoolwork more fun, but also because this approach better promotes healthy lifestyle habits. Several investigators have shown that **having fun in class can lead students to practice physical activity in their free time and to acquire a healthier lifestyle (Alexandr et al., 2016). Sedentary lifestyles are a global concern, evoking numerous political and social actions to avoid them, especially at school ages of childhood and adolescence (Guthold et al. 2018). An increase in sedentary behavior has spread through many countries and requires urgent measures (Bull et al. 2020). Specifically, the rates of obesity and other cardiovascular diseases in young people and adolescents have grown alarmingly, with Spain at the forefront of this trend (Rupérez et al. 2018), with adolescents are now generally less active in their free time (Trigueros et al. 2019).**

It would be important to know which factors are associated with student perceptions that PE classes are either satisfactory/enjoyable or boring. Fun is a pleasant emotion, conceived as a positive state of affection that represents such feelings as pleasure, enjoyment and fun during physical-sports activity (Moore et al. 2009). Thus, experiencing fun increases the well-being that students experience in the classroom (Gómez-Rijo 2013), while boredom is an unpleasant emotion that diminishes physical activity (Min & Kawabata 2022). It is important to create positive and rewarding experiences in PE classes in order to provoke increased motivation and commitment to oater physical exercise and avoid l inactive leisure time habits (Biolcati, Mancini and Trombini 2018).

Motivation is a determinant of behavior and is essential for promoting healthy

lifestyles (Knittle et al. 2018). One of the most relevant current theoretical frameworks to explain the development of physically active behaviors is Achievement Goal Theory (AGT) (Duda and Nicholls 1992; Nicholls, 1984). According to AGT, motivation is analyzed in two perspectives: dispositional and situational. Situational motivation is related to the motivational climate created by significant others, while dispositional motivation is related to one's own orientation (Rodrigues et al. 2020). At the dispositional level (motivational orientation), individuals can be task-oriented (in learning) and focus their behaviour on improving their personal skills. From this ego-oriented (performance) motivation, people focus their behaviour on results (Cid et al. 2019). In this way, the practice of physical activity may be motivated towards the task or one's ego (Ames 1984; Nicholls 1984), and that will determine one's perceptions of success and competence (Tomczak et al. 2020). In a task-orientation (Nicholls 1984), students would perceive physical practice as an activity to strengthen cooperative skills, social responsibility, and intrinsic motivation, thereby generating positive affect (Ntoumanis & Biddle 1999; Sympas & Bekiari 2018). This would promote greater effort and long-term adherence to these types of tasks out of an increased interest in learning, making an effort, and in improving (Leisterer & Jekauc 2019; Parish & Treasure 2003).

On the other hand, ego-oriented students (Tomczak et al. 2020) would define success by the ability to perform better than others. Superseding others' performances would be the main source of motivation to perform. In this orientation, students tend to compare their level of performance with that of others (Jaakkola, et al., 2016). They perceive the practice of physical activity and exercise as a source of recognition and social status, and as a means of increasing popularity (Leisterer & Jekauc 2019; Parish & Treasure 2003). Previous studies have highlighted that task-oriented students experience greater fun and flow states than do ego-oriented students (Duda & Nicholls 1992;

Ntoumanis, et al., 2009; Jackman et al. 2021). Previous investigators demonstrated a positive association between ego-orientated motivation and boredom (Min & Kawabata 2022, Baena-Extremera & Granero-Gallegos 2015). Thus, PE teachers should foster task orientated motivations (White et al. 2021).

There are also other psychological variables that may modify these relationships, such as the perception of self-esteem and self-efficacy. Self-esteem is an evaluation that people make of themselves (Butler & Gasson, 2005). Branden (2011) added that it is the essential disposition needed to face basic life challenges and feel worthy of happiness. Several investigators (e.g., Schneider, et al., 2008; Schmalz et al. 2007) have shown that teenagers with higher self-esteem approach physical exercise positively and regularly, while those with lower self-esteem tend to have less active physical lives and incur a higher risk of acquiring unhealthy habits and poor mental health (Orth, et al. 2010). Given the impact that self-esteem has on the practice of physical exercise, self-esteem should be considered when analyzing fun or boredom in PE classes.

Self-efficacy is another essential variable that stems from Bandura's Social Cognitive Theory (Bandura 1986), in which it is defined as one's personal belief in one's abilities to successfully perform a task and achieve the desired result (Bandura 1997). Consequently, people with higher self-efficacy will be more committed to tasks, will persist longer to achieve desirable results and will have higher level of self-satisfaction (Bandura 1997). More specifically, motor self-efficacy is the perception or feeling of competence that people possess for effectively managing situations related to physical activity (Hernandez & Garoz 2007). Thus, if students have higher motor self-efficacy, they will better commit to achievement in PE classes. In fact, researchers have shown that there were positive associations between students' perceptions of motor self-efficacy and fun in PE classes (Fraile et al. 2019).

An analysis of self-esteem and self-efficacy is fundamental in adolescent research.

In the school setting, researchers showed how these self-perceptions, together with motivational factors, contribute to higher satisfaction and academic performance (Scherrer & Preckel 2019). In addition, high levels of self-esteem and self-confidence allow teenagers to be more confident and positive in approaching new situations (Mikkelsen et al. 2020). Previous researchers may have ignored or incompletely considered interrelationships between motivational variables and self-related judgments of self-esteem and self-efficacy when analyzing whether students experience fun or boredom in PE classes. For this reason, we tested in this study whether there may be a significant mediating effect of self-esteem and self-efficacy on the relationship between task versus ego motivational orientations and fun or boredom.

Present Study

Previous studies have analyzed fun and boredom in relation to PE lessons in the Spanish context (e.g., Castillo et al., 2020; Morales-Sánchez et al., 2021), in which the specific relationship of the type of motivation and self-perceptions such as self-efficacy or self-concept in students' fun was observed. Unfortunately, these studies failed to encompass a complete model in which motivational variables, self-esteem, and self-efficacy were included. They have only been evaluated separately or in combination with other factors. Certain research has focused on self-perceptions but did not include motivational issues (Doménech-Betoret et al., 2017; Fraile et al., 2019). In others, motivational variables have been analyzed but they have ruled out exploring factors such as self-efficacy or self-esteem ((Fabra et al., 2021; Sevil et al., 2014).

Since the perceptions of competence and other personal attributions are essential to explain the levels of motivation as well as their incidence on the attitudes that are

presented about a task performed (Bandura 1997; Nicholls 1984), it is considered pivotal to include them together in the explanatory models. It is difficult to encounter studies that analyze the mediating effects that self-esteem and motor self-efficacy have on the relationship between motivational orientation of PE students and boredom or fun during classes. It is crucial to assess this aspect, because if we analyze solely the relationships between motivational orientation and fun in PE classes, we may obtain biased results by not considering other variables that could mediate these relationships.

As is known, self-esteem is a determining perception in the thoughts, feelings and cognitions of adolescents, being involved in their school adaptation processes. Therefore, it is consistent that self-esteem can determine the relationships between the type of motivational orientation they have in the context of PE and the feeling of fun or boredom. Furthermore, since we are talking about a specific achievement context, it is likely that specific domains such as the perception of motor self-efficacy may, in turn, mediate the proposed relationships.

In addition, the present study analyzes whether the model tested is modified by gender or age. Previous studies have found differences within gender and age when analyzing the relationships between motivational processes and enjoyment in physical education classes. However, this is a question that has not yet been clarified (Huhtiniemi et al. 2019). In relation to gender, previous studies have observed the existence of differences between boys and girls in factors such as the level of physical practice performed, motivational level or satisfaction in physical practice contexts (Babic et al. 2014; Granero-Gallegos et al. 2012). However, it is not clear whether these differences are caused by gender or by other cultural issues such as the activities they do in their free time, the experience of physical practice or other unrelated issues. For this reason, we consider it essential to perform an invariance analysis to find out if the model is robust

and not biased due to gender. On the other hand, age may be a factor affecting the results due to the instability of self-esteem and self-efficacy throughout adolescence (Bertills et al. 2018, Biddle et al. 2019). As we are aware, **these self-perceptions fluctuate over time, especially in a period as complex as adolescence (Monteiro et al., 2021). Thereby, invariance analysis between gender (boys vs girls) and age (youngsters ≤ 14 years old vs elders >14 years old) was also conducted to demonstrate that the study can be replicated in groups with different characteristics.**

Therefore, the aim of this study was to explore the relationship between motivational orientation (ego vs. task) and fun or boredom in PE classes, assessing the mediating effects that self-esteem and self-efficacy could cause. The hypothesized model is shown in figure 1, which indicates the positive or negative value of the relationships expected to be found. Also, these relationships should be valid for both boys and girls and for the different age groups (≤ 14 years old and >14 years old).

--- Insert figure 1 here ---

Method

Participants

Participants in this research were 478 adolescents (236 boys, 242 girls) aged between 13 and 18 years ($M= 14.57$, $SD= 1.15$). They were in secondary education in Jaén (Spain) where PE is a compulsory subject in all grades with weekly class time of two hours. All participants attended class regularly. Our exclusion criteria were: (a) not attending class frequently; (b) showing difficulty in understanding the research questions; (c) having had some injury in recent weeks; and (d) having recently joined the school. To demonstrate that this model was structurally invariant and that it can be replicated in

groups with different characteristics, we divided the participant sample into four groups by: (a) sex (boys vs girls); (b) age (≤ 14 years old vs >14 years old); Spanish grade (i.e., 12 - 14 years old in 1st and 2nd years of secondary school; 15 - 18 years old in 3rd and 4th years of secondary school and 1st and 2nd years of high school).

Throughout the research, we respected the Helsinki declaration, and we obtained prior approval to conduct the study from the ethics committee of the University of Málaga. We requested permission to approach parents from the school management and the PE teachers. First, we contact them by phone call or email, and later we request verbal or written consent to participate in the research. **After that, the details of the investigation were subsequently explained.** We obtained informed consent from the students' making clear that participation was voluntary and anonymous. We then explained the purpose of the study to the students and obtained their informed assent for participation.

Measurement Instruments

We used the **Ego and Task Orientation Questionnaire (TEOSQ)** (Duda & Nicholls 1992) in its Spanish version as it is often used in PE (Balaguer, et al. 1996). It consists of 13 items and two factors that assess students' tendencies towards an ego (6 items, e.g. **"When others can't do it as well as me"**) and task (7 items, e.g. **"I feel that a skill I have learned works"**) motivation orientation in the context of PE. This instrument uses a 5-point Likert-type scale to collect the responses, with item scores ranging from strongly disagree (1) to strongly agree (5). **For the present investigation,** the internal consistency analyses (Cronbach's alpha) offered values of .84 for task orientation factor and .88 for ego orientation.

We used the **Rosenberg Self-Esteem Scale (RSE)** (Rosenberg 1965; Atienza, et al., 2000) to measure participants' self-esteem. This scale analyzes the respondent's

global attitude, favorable or unfavorable, toward the self (Rosenberg 1965). It consists of 10 items and two factors (positive and negative self-esteem). For this study, we used the positive self-esteem dimension, consisting of five items (e.g., “On the whole, I am satisfied with myself”). Items were answered using a Likert-type scale from 1 (Strongly disagree) to 4 (Strongly agree). For the present investigation, internal consistency analysis (Cronbach's alpha) gave a value of .85.

We used the **Motor Self-Efficacy Scale (MSES)** (Hernández-Álvarez et al. 2011), adapted for the motor domain from the Baessler y Schwarzer (1996) General Self-Efficacy Scale (GSE). This instrument analyzes the respondent's personal perception of competence to cope with motor tasks. It consists of 10 items (e.g. “In PE classes I can solve difficult tasks if I try hard enough”) and a single factor, with items answered using a Likert-type scale from 1 (strongly disagree) to 4 (strongly agree). For the present investigation, the internal consistency analysis (Cronbach's alpha) gave a value of .88.

We used the **Sport Satisfaction Instrument (SSI-PE)** (Duda & Nicholls 1992) as adapted to PE in the Spanish version from the original Sport Satisfaction Instrument (Baena-Extremera et al. 2012; Balaguer et al. 1997) to measure participants' affective responses to PE. This scale measures intrinsic satisfaction in an activity through eight items and two factors: (i) satisfaction/fun (5 items, e.g. “I usually have enjoyment in the PE classes”) and (ii) boredom (3 items, e.g. “In PE, I usually wish the class would end quickly”), with items answered by Likert-type scales from 1 (do not agree at all) to 4 (strongly agree). For the present investigation, the internal consistency analysis (Cronbach's alpha) gave values of .87 for the satisfaction/fun factor and .73 for boredom.

Procedure

As noted, participants were from four schools in Jaén (Spain). All were from

similar socioeconomic levels and were enrolled in the same school curriculum. The questionnaires were administered at the beginning of May so that the students' attitudes and perceptions toward PE were already established. The data was collected in PE class, and the students completed the questionnaires in about 40 minutes in the presence of the PE teacher. A researcher from our team explained in detail to the students how the questionnaires were to be completed and answered any questions that arose.

Data Analysis

We analyzed means, standard deviations and bivariate correlations of all variables. To test the model, we performed a two-step maximum likelihood approach (Kline, 2016) using IBM SPSS Amos v.27 software. Firstly, we conducted a confirmatory factor analysis (CFA) to analyze the psychometric properties of the presented model. We used composite reliability (Raykov, 1997) to evaluate the internal consistency, considering .70 as the cut-off value (Hair et al. 2018), and we calculated average variance extracted (AVE) to analyze convergent validity (Hair et al. 2018). We determined discriminant validity when the squared correlations between the constructs and any other were lower than the AVE (Fornell and Larcker 1981). Secondly, we performed structural equation modeling (SEM) to test the relationships among the study variables. Standardized direct and indirect effects were analyzed, considering coefficients significant if the 95% Confidence Intervals (CI) did not include zero (Williams & MacKinnon 2008). We used Boot-strap resampling (1000 samples) considering a bias corrected 95%CI to assess the significance of the direct and indirect effects. For the CFA and SEM, we used the following indices: Comparative Fit Index (CFI), Tucker Lewis Index (TLI), Standard Root Mean Residual (SRMR), and Root Mean Square Error of Approximation (RMSEA)

with its Confidence Interval (CI: 90%). For these indices, scores of CFI and TLI ≥ 0.90 , SRMR and RMSEA ≤ 0.8 were considered as acceptable (Byrne 2016; Hair et al. 2019; Marsh, Hau & Wen 2004).

Mediation Analysis

Serial mediation analyses were used to evaluate relationships among the constructs (Hayes, 2018), using SPSS PROCESS v.3.5 software (model 6 – with two serial mediators). The model 6 allowed control over the indirect effects of each mediator while controlling other variables (i.e., all variables included in the model), also permitting independent mediator effects analysis, and providing regression coefficients for the causal steps of the specified indirect effects. We used bootstrap (5000 samples) analysis (Hayes 2018; Williams and MacKinnon 2008).

Multigroup Analysis

We conducted a SEM multigroup analysis to demonstrate that the hypothesized model could be replicated in groups with different characteristics, in this case between sex and age (Byrne, 2016). Therefore, we followed the recommendations of Cheung and Rensvold (2002) and Byrne (2016): (i) the SEM model should provide an acceptable fit in each group; (ii) the subsequent invariance types (i.e., unconstrained model; measurement weights; structural weights; measurement intercepts, structural residuals, and measurement residuals) should be respected. Invariance standards were assessed via the differences in Comparative Fit Index ($\Delta\text{CFI} < .01$), as suggested by Cheung and Rensvold (2002). The analysis was performed with AMOS v.27.0 software.

Results

Preliminary Analysis

We used Full Information robust Maximum Likelihood (FIML) to manage the small amount of missing data (missing at random= 2%) (Enders, 2010). Then, we analyzed the descriptive statistics and bivariate correlations. The Skewness (-2 to +2) and Kurtosis (-7 to +7) indicated no deviations from univariate normality (Hair et al., 2018). However, as the normalized estimate of Mardia's coefficient of multivariate kurtosis was greater than 5.0, we used the Bollen-Stine bootstrap on 2000 samples for analysis (Nevitt & Hancock 2001).

Table 1 shows the descriptive statistics, composite reliability coefficients, average variance extracted, and latent correlations for these data. Skewness and kurtosis showed that the data comprised a normal distribution. Also, composite reliability coefficients had good internal consistency (>0.70). Related to latent correlations, all variables were statistically correlated. Most of the relationships were positive, except those between boredom with task orientation, self-esteem, motor self-efficacy and fun.

--- Insert table 1 here ---

The analysis of measurement model included the factors task-orientation, self-esteem, motor self-efficacy, fun and boredom variables and showed an acceptable fit to the data: $\chi^2 (579) = 1357.88$; B-Sp < .001; CFI = .91; TLI = .90; SRMR = .059; RMSEA = .053 90%CI [.036, .052]. The CR coefficients indicated scores above 0.70, showing an adequate internal consistency. For convergent validity, all factors presented scores above 0.50, except task orientation and motor self-efficacy. In addition, considering the squared correlations and AVE scores, all factors demonstrated adequate discriminant validity

since the squared correlations of each latent variable were lower than AVE scores in each latent variable, except between self-esteem and motor self-efficacy. Therefore, these results provided preliminary support for conducting a regression model and analyzing the direct and indirect effects. The results showed an acceptable fit to the data in all samples under analysis: general sample ($n=478$): $\chi^2(583)=1406.02$; B-S $p < .001$; CFI= .90; TLI= .90; SRMR= .062; RMSEA= .054 90%CI [.051, .058]; boys sample ($n=236$): $\chi^2(583)=1074.02$; B-S $p < .001$; CFI= .92; TLI= .91; SRMR= .071; RMSEA= .061 90%CI [.054, .065]; girls sample ($n=242$): $\chi^2(583)=1139.42$; B-S $p < .001$; CFI= .91; TLI= .90; SRMR= .077 RMSEA= .061 90%CI [.054, .065]; ≤ 14 years old sample ($n=249$): $\chi^2(583)=1136.07$; B-S $p < .001$; CFI= .92; TLI= .91; SRMR= .072; RMSEA= .062 90%CI [.056, .067]; >14 years old sample ($n=229$): $\chi^2(583)=1057.69$; B-S $p < .001$; CFI= .93; TLI= .92; SRMR= .079; RMSEA= .060 90%CI [.054, .065].

Multigroup Analysis

Results showed that the SEM model was invariant between both sex and age (male and female; ≤ 14 years old and >14 years old), since these invariance assumptions were met (see Table 2). Therefore, all factor, structural paths, factor covariances, factor residual variances, and measurement error variances were operating equivalently between genders ($\Delta CFI < .01$).

--- Insert Table 2 here ---

Direct and Indirect effects

Since the structural model revealed an adequate fit to the data in all the samples under analysis and the multigroup analysis indicated that the model was invariant, direct and indirect paths of general sample were performed. These results showed the following

direct effects (Figure 2): (a) ego orientation was positively associated with both self-esteem and boredom; (b) task orientation was positively associated with both self-esteem and fun, and negatively associated with boredom; (c) self-esteem was positively associated with motor self-efficacy; and (d) motor self-efficacy was positively associated with fun.

--- Insert figure 2 here ---

Related to indirect effects, the analysis showed the following effects (Table 3): (a) ego orientation had a positive and indirect effect on self-efficacy and fun, and a negative effect on boredom; (b) task orientation had a positive and indirect effect on self-efficacy and fun, and a negative effect on boredom; and (c) self-esteem had a positive and indirect effect on fun.

--- Insert table 3 here ---

Mediation Analysis

Serial mediation of self-esteem and self-efficacy in the associations between ego-orientation and task orientation and boredom and fun are presented in Figure 3 (3a, 3b, 3c, and 3d). Results from figure 3a showed a total mediation since the indirect effect was higher than the direct effect. In turn, Figure 3b exhibited a negative partial mediation, because the indirect effect annulled part of the direct effect. Regarding Figure 3c a positive partial mediation appeared. Although the positive indirect effect observed did not annul the total direct effect. Finally, in Figure 3d, no mediation effect was observed since the indirect effect was not significant. All in all, all the paths across ego and task-orientation motivation, self-esteem, self-efficacy and boredom and fun were significant, except for the association between ego-orientation and fun in Figure 3a. In addition, the

mediator's self-esteem and self-efficacy explained 18%, 16%, 46% and 22% of the variance for models presented in Figures 3a, b, c, and d, respectively.

--- Insert Figures 3a, 3b, 3c, and 3d here ---

Discussion

Our aim in this study was to explore the relationships between motivational orientations (ego vs. task-orientation) and fun and boredom of adolescents in PE classes, while assessing the mediation effects of self-esteem and motor self-efficacy. In addition, we analyzed the stability of the proposed model through multigroup analyses between gender (boys vs girls) and age (≤ 14 years old vs >14 years old).

Our results revealed a statistically significant and positive association between ego-oriented motivation and boredom in PE classes, while task-oriented motivation was positively associated with fun and negatively associated with boredom. Likewise, positive relationships were found between ego and task orientations with perceived self-esteem, and between self-esteem and motor self-efficacy.

Firstly, our structural equation analyses showed direct effects between the variables of the model. We found that, when students showed a higher task motivation, they showed higher levels of fun and lower levels of boredom during PE classes. In contrast, their higher ego motivation predicted boredom during the class. These results are in line with previous research that found task-oriented motivation associated with higher levels of fun and satisfaction with the practiced activity in the context of physical-sport activity, just as ego-oriented motivation was more connected to boredom (Baena-Extremera & Granero-Gallegos 2014, 2015; Cecchini et al. 2005; Fraile-García et al. 2019; Jackman et al. 2021; Min & Kawabata 2022).

Specifically, these results are congruent with other studies in the context of PE classes (Duda et al. 1992; Granero-Gallegos et al. 2012; Kalaja et al. 2009). Among other reasons, when students orientate toward the task, they focus on elements that are more intrinsically linked to the physical practice itself, participating in the proposed exercises to have fun and enjoy themselves. However, when their participation is ego-oriented, there is a greater emphasis on winning and doing better than others, which increases the pressure to do well and requires a high level of competence. Ego-oriented motivation usually requires high levels of competitiveness which does not always happen in learning-oriented PE classes and can result in frustration for the participant (García-González et al. 2019).

Secondly, structural equation modeling in our study highlighted statistically significant indirect effects between ego and task-oriented motivation and boredom and fun, as mediated by self-esteem and motor self-efficacy. To explore these effects, we conducted mediation analyses. Self-esteem and motor self-efficacy had a positive and statistically significant relationship with fun in PE, and a negative association with boredom, which mediated the initial relationships between ego/task orientation with fun and boredom. For instance, the direct relationship between ego-orientation and fun was not significant, but it was positive and statistically significant when self-esteem and motor self-efficacy were included in the analyses. In addition, the relationship between ego-orientation and boredom became negative only when self-esteem and motor self-efficacy were incorporated into the explanatory pathway. This effect reflects that a student who has an ego-oriented motivation, who is more likely to become bored or frustrated in class, would not show such feelings if he has an adequate perception of himself. This could occur because he is able to adapt better to situations in which he must compare himself with other students or evaluate his performance during classes. Moreover, in all cases we

observed that these self-perceptions were positively associated with fun and negatively associated with boredom.

Fundamentally, these results highlight the importance of self-esteem and self-efficacy when a person faces a task, in this case motor activities in the context of school PE. In fact, these perceptions mediated the relationships between the motivational orientation and attitude with which students approached PE classes. These results highlight the importance of positive development of self-esteem and self-efficacy in high school students, since these factors can improve the way in which students adapt to school tasks, decreasing the chances of their dropping out of physical activity later. These types of self-perceptions, when positive, improve the likelihood of successfully carrying out an activity, and contribute to participants feeling happier and enjoying to a greater extent the challenges they face (Bandura 1997; Butler & Gasson 2005; Branden 2011; Hernández y Garoz 2007).

Our results suggest that higher self-esteem and motor self-efficacy generate an improved perception of capacity and security to face the motor challenges proposed in the PE classes in the sample studied, as well as greater well-being and personal happiness, which probably had an impact on the extent to which fun increased and boredom decreased when the motivational orientation was directed to the ego. In line with these findings, several authors (Fraile-García et al. 2019) have previously related motor self-efficacy with fun during physical practice, considering that a better perception of self-efficacy has an impact on **more possibilities of enjoying physical activity and maintaining interest in the practice**. Although task-oriented motivation is more closely related to learning and ego-oriented motivation is more closely related to performance (Cid et al. 2019), in both, the perception of competence and personal assessment influences perceptions of success and satisfaction with the activity performed (Tomczak et al. 2020),

which is crucial for subsequent pursuit of the student's objectives (Sympas & Bekiari 2018).

Thirdly, we found our model to be invariant when analyzed according to gender and age. This is an interesting outcome, since it demonstrates different results from those of prior studies in which differences according to gender and age had been observed. Our finding supports the suggestion that gender and age differences between participants could be due to cultural issues, such as participants' life habits, their experience of physical practice, or variations in self-perceptions throughout adolescence (Babic et al. 2014; Bertills et al. 2018, Biddle et al. 2019; Granero-Gallegos et al. 2012; Huhtiniemi et al. 2019).

Our results are relevant to ongoing research in this area, since many prior studies linked motivational orientation with fun or boredom in PE classes, while ignoring any mediating effect of self-esteem and self-efficacy. Our data show how these variables modified these results, and how data interpretation errors could be made in their absence. Since fun or boredom in PE often determine later adherence to physical practice and maintenance in of out-of-school physical activity and fun in PE classes and perceived motor self-efficacy have a positive and direct effect on physical activity levels (Cox et al., 2008), it is important to consider both motivational factors and the type of self-perceptions (self-esteem and self-efficacy) we studied to improve explanatory models of fun and boredom in PE classes.

Limitations and Directions for Further Research

This study has some limitations. First, self-esteem and self-efficacy are perceptions that can evolve throughout adolescence. While we studied students between

13 and 18 years of age, it would be interesting to assess the relationships between these variables in other specific age groups in the future. Second longitudinal studies would help to better assess changes through development in these variables. Third, intervention studies that focused on motivational orientations and mediating effects of self-esteem and self-efficacy would allow us to observe how these relationships might be further modified in PE classes.

Conclusion

The results obtained in this research highlight the importance of motivational orientation for generating a perception of fun (versus boredom) in PE. Our data also show that a higher level of self-esteem and motor self-efficacy can improve perceptions of fun and decrease perceptions of boredom in PE, despite one's ego-oriented motivation. Therefore, when attempting to analyze attitudes towards PE, it is not only necessary to consider motivational variables, but also to consider **other psychological self-perceptions that can mediate the relationships between these variables. So, PE teachers and planners should promote a student experience of fun in PE classes by prioritizing task-oriented motivation and enhanced student self-esteem and self-efficacy.**

Disclosure statement

No potential conflict of interest was reported by the author(s).

Data availability statement

Data are available upon request from the authors.

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