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Article in *Journal of Teaching in Physical Education* · January 2022

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Portuguese Students' Perceptions About the Motivational Climate in Physical Education

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Purpose: To validate the English version of the L'Echelle de Perception du Climat Motivational within a Portuguese context and analyze students' perceptions of the motivational climate in physical education and its relationship to demographic variables, participation in extracurricular sports, and students' grades. **Methods:** A total of 476 Portuguese students participated in the study and completed the L'Echelle de Perception du Climat Motivational (249 men = 52.3%; 227 women = 47.7%). Statistical analysis was used to evaluate the importance of motivational climate in physical education classes. **Results:** Our results suggest that the Portuguese version of the L'Echelle de Perception du Climat Motivational is valid and reliable. Furthermore, motivational climate is a predictor of both extracurricular sports participation and grades. **Discussion and Conclusion:** The finding that motivational climate is a predictor for extracurricular sports participation and grades supports the relevance of the climate fostered by physical education teachers and its influence on learning. This study discusses implications for research and practice.

Keywords: physical activity, sport, gender, socioeconomic status


The decline in physical activity (PA) has been a matter of concern for a range of organizations (Bull et al., 2020) and stakeholders, such as physical education (PE) teachers and health professionals. Despite many concerns and intervention efforts to change this reality, PA levels have continued to decline, which has resulted in an increase in many correlated diseases in sedentary populations, such as coronary disease (Guthold et al., 2020). PA is instrumental in improving health and increasing quality of life (Gill et al., 2013). Furthermore, over the last decade, PA has been considered an important tool for preventing the escalation of mental health-related diseases (Sallis et al., 2021; Taylor et al., 1985). Therefore, PA has been positioned as a tool to overcome societal challenges, such as an increase in sedentary behavior due to the COVID-19 pandemic. It aims to improve health in all population cohorts by meeting individuals' mental, emotional, and social needs (Whitley et al., 2021).

To enhance our understanding of current PA levels, we should consider PE as an important mediating variable that may encourage youth to become physically active throughout their lives (Baena-Extremera et al., 2015; Hagger & Chatzisarantis, 2007; Soini et al., 2014; Taylor et al., 2010). However, this is not the only goal of PE. PE may also provide important contributions to social and emotional learning and holistic youth development (Wright et al., 2021). It is necessary for teachers, policymakers, and researchers to remember that PE is a tool to develop a person holistically, so it must be seen as more than just a means to increase health and PA levels (Cairney et al., 2019). Indeed, this conceptual (mis)understanding has been widely debated, and many advances have been made in improving the perception of the value of PE across sociocultural contexts and educational systems. Consequently, to use PE strategically and attain positive outcomes, researchers have highlighted the importance of students' perceptions of the

motivational climate within PE and extracurricular sports (Girard et al., 2019; Gutiérrez et al., 2018). Participation in extracurricular sports is considered of paramount importance because it is associated with higher levels of PA and motivation (Belton et al., 2017; De Meester et al., 2017). For example, De Meester et al. (2017) conducted a study with a sample of 1,526 students to examine whether students who participated in extracurricular school-based sports were more physically active and/or autonomously motivated toward sports than were nonparticipants. The findings showed that students who participated in extracurricular school-based sports were significantly more physically active and autonomously motivated toward participating in sports. Belton et al. (2017) reinforced these findings and highlighted that students from underserved contexts who participated in extracurricular PA were significantly more physically active than those who did not participate.

Achievement Goal Theory

In the present study, Achievement Goal Theory (AGT) was used as an overarching framework to explore students' perceptions of the motivational climate in PE. In recent years, AGT has been one of the main theories examining motivation in PE (Biddle et al., 2003; Kuczek, 2013). In AGT, it is assumed that an important goal of fostering a positive motivational climate is to help individuals develop competence and enhance their overall abilities (Nicholls, 1984, 1989). An individual's perceptions of competence and overall ability influence the orientation of achievement goals, which can be task or ego oriented (Nicholls, 1984, 1989; Roberts, 1992). According to Nicholls (1984, 1989), these two goal orientations can influence the way an individual builds his or her level of competence and overall ability in a particular situation. In a task-oriented environment, individuals' perceptions of competence and overall ability are self-referential and dependent on progress and learning (Roberts, 1992; Treasure & Roberts, 2001; Wang et al., 2010). Individuals believe that subjective

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success depends on improving their own execution, acting with mastery, developing new skills, and exerting maximum effort (Ntoumanis & Biddle, 1999; Standage et al., 2003b). In contrast, in a performance-oriented climate, individuals' perceptions of competence are normative and comparable to those of others. Under these circumstances, success depends on a subjective evaluation of an individual's performance when compared to the performance of others, particularly when less effort is put forth (Ommundsen et al., 1998; Papaioannou, 1998; Roberts, 1992; Wang et al., 2010).

The AGT can be considered from two perspectives (Jaakkola et al., 2015). First, AGT emphasizes an individual's perception of competence regarding an activity (i.e., goal orientation), which is considered a dispositional variable. Second, AGT highlights the importance of an individual's perception of the social environment (i.e., motivational climate), which is understood as a situational variable. Motivational climate is a key element of AGT and consists of perceived implicit or explicit signals from the environment through which the keys to success and failure are defined (Ames, 1992b; Soini et al., 2014). The two types of motivational climates that may be considered in PE and sports settings are task- and ego-oriented climates (Harwood et al., 2015; Wang et al., 2010). In general, students tend to perceive a mastery climate when situational signs enhance learning and improvement, effort is rewarded, there is an atmosphere of assistance and support from teachers, and mistakes are understood to be an integral part of learning. Conversely, students are more likely to perceive a performance climate when competition and normative comparisons are used. In this type of environment, mistakes are punished, so students are afraid of making them (Ames, 1992a; Roberts, 1992; Standage et al., 2003b; Wang et al., 2010).

The AGT has been extensively explored in previous studies and several versions of AGT have been developed. Elliot and McGregor (2001) developed the 2×2 model, where task- and ego-oriented goals included in the initial version of the AGT were divided into approach and avoidance goals. Within this version of the AGT, approach goals include positive possibilities and avoidance goals integrate negative possibilities. Thus, four types of achievement goals are considered: approach-task, avoidance-task, approach-ego, and avoidance-ego. More recently, Elliot et al. (2011) developed a 3×2 model and established three standards for competence: absolute, interpersonal, and intrapersonal. In this version of the AGT, competence can be examined in absolute terms (i.e., performance in a task), as well as through intrapersonal (i.e., personal achievement) and interpersonal (i.e., achievement in comparison to others) lenses. Finally, Elliot et al. (2006) developed a 4×2 model that included social motivation within approach and avoidance goals. Thus, these goals are positioned as being dependent on individuals' efforts toward developing social competence.

Based on previous notions, research has revealed that in the context of PE classes, students more often perceive a motivational climate that is oriented more toward mastery than toward performance (Bakirtzoglou & Ioannou, 2011; Granero-Gallegos et al., 2017; Moreno-Murcia et al., 2011; Soini et al., 2014; Treasure & Roberts, 2001; Wang et al., 2010). Most of the research in this context has sought to examine the correlations between students' perceptions of motivational climates and their engagement and overall satisfaction with PE (Hastie et al., 2013; Papaioannou et al., 2004; Rudisill, 2016). Studies have consistently shown that a mastery climate is positively correlated with intrinsic motivation, positive attitudes toward PE, and the intention to be physically

active (Barkoukis & Hagger, 2013; Bryan & Solmon, 2012; Cunningham & Xiang, 2008; Escartí & Gutiérrez, 2001; Gutiérrez et al., 2018; Harwood et al., 2015; Moreno-Murcia et al., 2011; Ntoumanis & Biddle, 1999; Ommundsen et al., 1998; Papaioannou et al., 2007; Sproule et al., 2007; Treasure & Roberts, 2001; Wang et al., 2008). By contrast, a performance-oriented climate in PE is associated with less satisfaction, fun, and enthusiasm (Bakirtzoglou & Ioannou, 2011; Escartí & Gutiérrez, 2001; Ferrer-Caja & Weiss, 2000; Granero-Gallegos et al., 2017; Gutiérrez et al., 2018; Spittle & Byrne, 2009; Sproule et al., 2007; Wang et al., 2010).

Owing to the complex nature of understanding PE's motivational climate, several variables have been considered. With regard to grade levels, investigations have shown inconsistent results. While some studies found that as students advanced in age or grade level, they tended to consider PE classes to be more performance oriented, other studies found no significant difference (Cid et al., 2019; Halvari et al., 2011). There is more clarity regarding gender. Studies have shown that boys have more performance-oriented perceptions of the motivational climate in PE than girls. Conversely, girls perceive their PE classes as oriented toward mastery (Bakirtzoglou & Ioannou, 2011; Tidmarsh et al., 2022). Several studies (Escartí & Gutiérrez, 2001; Sproule et al., 2007) have examined the influence of students' perceptions of the motivational climate in PE on both extracurricular sports participation and school grades. Escartí and Gutiérrez (2001) conducted a study of 975 Spanish youth ranging from 13 to 18 years of age and examined the effects of the motivational climate in PE on students' motivation, interest, and intention to practice sports. The findings showed that a climate more oriented toward performance negatively affected students' interest in extracurricular sports participation. Sproule et al. (2007) reached the same conclusions in a study of 1,122 adolescent students from Singapore. Interestingly, few studies have examined the relationship between students' perceptions of the motivational climate in PE and sociodemographic variables (Harwood et al., 2015).

Schools, especially through PE programs, play an important role in fostering extracurricular sports participation and increasing PA levels outside the school environment (Vella et al., 2020). Indeed, schools aim to create solid grounds for youth to become intrinsically motivated to participate in physical activities and engage in organized sports, among other types of physical activities. However, we should bear in mind that meaningful engagement in extracurricular sports is influenced by the quality of those activities and the experiences provided to youth (Balaguer et al., 2020).

Despite the studies conducted within this line of inquiry, variables associated with AGT have been examined predominantly in English-speaking countries such as the United States of America. However, to generate better outcomes in and through PE on a global scale, research across a range of sociocultural contexts is required. This research represents a necessary step because PE could have diverse cultural meanings, teachers may have different understandings of how teaching and learning should occur, and delivery may vary depending on teacher training, beliefs, and values (Kirk, 2006). In Portugal, PE is a compulsory discipline across all grade levels, and students' PE grades are considered in their weighted average when applying to a university or polytechnic institute (Pereira et al., 2020). Furthermore, similar to other European countries (Pot et al., 2014), participation in school sports has decreased over the years as most youths join competitive sports clubs, where game performance, results, and skill development are

the main objectives. Despite the opportunities provided for youth to engage in sports outside the school environment, obesity in Portugal has increased exponentially in recent years (Organization for Economic Cooperation and Development, 2019), which has raised awareness about the quality and reach of PE and youth sports.

Although some studies have attempted to investigate the quality of PE within the Portuguese context (Cid et al., 2019; Pereira et al., 2020), the lack of standardized measures available in Portugal limits our understanding of PE's motivational climate. This study explores the context of PE in Portugal in terms of its motivational climate. Therefore, it has the following aims: (a) to validate the English version of the L'Echelle de Perception du Climat Motivational (EPCM; Biddle et al., 1995) in a Portuguese context; (b) to analyze students' perceptions of the motivational climate in PE; (c) to examine the relationship between socio-demographic variables and students' perceptions of the motivational climate in PE; and (d) to examine the relationship between students' perceptions of the motivational climate in PE, their participation in extracurricular PE sports, and their grades. After considering different AGT versions and previous research in the field (Girard et al., 2019), we selected the initial dichotomous AGT model because it drove the creation of the EPCM, and it enables researchers to differentiate between the dimensions of performance- or mastery-oriented motivational climates in PE. Researchers have also alluded to the fact that other AGT versions include numerous achievement goals and categories that may be more difficult for youth participants to understand and grasp (Garn et al., 2011). Therefore, this was one of the first studies to attempt to accomplish these aims (Cid et al., 2019), and the initial AGT version served as the basis for an initial exploration of the Portuguese PE context.

Methods

Study Phases

The study was conducted in two phases. In the first phase, we validated the EPCM, which included the following steps: translation, confirmatory factor analysis (CFA), discriminant and concurrent validity analysis, and an examination of reliability. In the second phase, the Portuguese version of the EPCM was used to assess the association between motivational climate and several sociodemographic variables, including participation in extracurricular sports and grades.

Sample

A nonprobability sampling method was used to recruit 476 students (249 boys = 52.3%; 227 girls = 47.7%) aged 12–17 years ($M = 13.38$; $SD = 0.95$). These students attended Grades 7, 8, and 9 in five high schools located in the urban areas of five districts in northern and central Portugal. These schools were purposefully selected as a convenience sample. The five schools were contacted by the first author and agreed to participate in this study. Within the Portuguese education system, Grade 7 corresponds to the beginning of high school, and Grade 9 corresponds to the final year of that education level. It should be noted that PE teachers were selected randomly, so the research team was not aware of the quality of the PE programs delivered in each school.

Regarding socioeconomic level, 47.7% of the students were from middle-income families, 38.4% were from lower-income

families, and 13.9% were from higher-income families. With regard to participation in extracurricular sports activities, 65.5% of the male students and 58.1% of the female students participated. Students' grades in Portugal range from 1 to 5, where 1 and 2 represent insufficient performance in PE, 3 is sufficient, 4 is very good, and 5 is excellent. Students were given a grade based on their motor performance in PE. In this study, 38.7% of students obtained a grade of 3, 49.8% a grade of 4, 9.2% a grade of 5, and 2.3% of students achieved a grade of 2. None of the students received a grade of 1.

Instruments: L'Echelle de Perception du Climat Motivational

Students' perceptions of the motivational climate in PE were assessed using the English version of the EPCM (see Biddle et al., 1995, for the full version of the questionnaire). The EPCM contains 19 items. It was developed with the objective of assessing students' perceptions of the PE climate and the extent of its orientation toward either mastery or performance (Standage et al., 2003a, 2003b). The EPCM consists of five first-order factors: "Pursuit of progress by pupils" (five items; e.g., "the pupils are very pleased when they learn new skills and games"), "Promotion of learning by teacher" (four items; e.g., "the PE teacher is pleased when each pupil learns something new"), "Pursuit of comparison by pupils" (three items; e.g., "pupils try to do better than one another"), "Promotion of comparison by teacher" (three items; e.g., "the teacher particularly appreciates those who win"), and "Worries about mistakes" (four items; e.g., "the pupils worry about making mistakes"). In the EPCM, students are asked to answer questions based on the phrase, "In my PE class . . .," using a 5-point Likert-type scale, ranging from 1 (*I totally disagree*) to 5 (*I totally agree*). The authors found that the EPCM had satisfactory reliability and validity. Cronbach's alpha values were all higher than .78. The CFA revealed an acceptable fit of the model ($\chi^2/df = 1.95$; goodness-of-fit index [GFI] = .91; adjusted GFI = .87; root mean square residual [RMSR] = .066).

Sociodemographic Variables and Sports Participation Questionnaire

A questionnaire was administered to collect data from students regarding their age, education level, gender, socioeconomic status (SES) of their family, extracurricular sports participation, and PE grade. To verify the SES of the students' families, questions were centered on the parents' professions and academic backgrounds, which were subsequently validated according to the criteria proposed by Simões (2000) for the Portuguese population. Students were also asked whether they practiced extracurricular sports and for their PE grade at the end of the second school term, as data collection occurred during this time of the school year.

Procedures

The authors of the original version of the EPCM authorized us to validate the instrument. In the initial phase, the instrument was translated into Portuguese using the back-translation method, which is the most commonly used method in social sciences (Douglas & Craig, 2007). We asked two university teachers whose first language was Portuguese, but who were fluent in English, to translate the questionnaire into Portuguese. Thereafter, the two

translations were compared, and no major differences were found between them. Later, we asked another university teacher to translate the final Portuguese version into English. The original version of the EPCM was compared with the results of the retroversion. As there were no differences, the questionnaire was considered adequate. A pilot study was conducted with a group of 30 high school students to check for language clarity and to ensure that all items were understandable.

Data were collected during the second school term as part of a broader project that focused on the quality of PE in Portugal. Ethical approval was obtained from the Portuguese Ministry of Education through the Office of Statistics and Educational Planning. Subsequently, school principals, PE teachers, and students' parents or tutors were informed of the objectives of the study, and informed consent was obtained. After explaining the study's objectives to the students, we emphasized that their participation was voluntary. We stated that there were no right or wrong answers to any of the items, and that students should answer with the utmost sincerity. The EPCM was completed at the beginning or end of a PE class, with a researcher always present to provide any necessary clarification. The students took approximately 10 min to complete the questionnaire.

Data Analysis

In the first stage, we tested the psychometric properties of the EPCM using the *Analysis of Moment Structures* software, version 24. Initially, the asymmetry and kurtosis coefficients were analyzed along with the Mardia (1970) coefficient to verify the univariate and multivariate normality of the distribution of the item values, respectively. Concerning univariate normality, items with asymmetry values higher than 3 (Sk , with $|Sk| > 3$) and kurtosis values higher than 10 (Ku , with $|Ku| > 10$) are considered to have sensitivity problems (Kline, 2016). The existence of multivariate normality in the data is understood to be adequate when the Mardia coefficient (1970) is lower than $P(P+2)$, where P is the number of variables observed (Bollen, 1989). We also checked for the presence of outliers using the Mahalanobis square distance formula (D^2 ; Kline, 2016).

To examine the fit of the Portuguese version of the EPCM to the factorial structure proposed by the authors of the original version (Biddle et al., 1995), a CFA was conducted using the maximum likelihood method. To examine the quality of the global adjustment based on the proposed factor model, the following indices were used: chi-square and degrees of freedom ratio (χ^2/df), GFI, comparative-fit index (CFI), normed fit index (NFI), Tucker-Lewis index (TLI), root mean square error of approximation (RMSEA), and RMSR. The model is considered to have an acceptable adjustment when the following values are recorded: $\chi^2/df < 5$, $GFI > .90$, $CFI > .90$, $NFI > .90$, $TLI > .90$, $RMSEA < .10$, and $RMSR < .10$ (Byrne, 2010; Hu & Bentler, 1999; Kline, 2016).

The reliability of the construct was estimated using individual (λ^2) and composite (FC) reliability. For convergent validity, the average variance extracted (AVE) was calculated for each factor, with a cutoff point of 0.5. The discriminant validity of the factors was assessed by comparing the AVE values with the squares of their correlations. In the second phase of the study, the data were processed using SPSS software (Statistics Package for Social Sciences, version 24). We began by performing a descriptive analysis (mean and SD) of the data recorded by the different student groups. We attempted to ascertain whether the students perceived the motivational climate as oriented toward mastery or performance, using the Student's t test. Subsequently, several multivariate analyses of variance (MANOVA) were conducted

to determine significant differences in students' perceptions of the motivational climate according to their level of education (Grades 7, 8, and 9), gender (male vs. female), and SES (high, medium, and low). In the MANOVA, students' perceptions of the motivational climate (mastery and performance) were considered as dependent variables, while education level, gender, and SES were considered as independent variables. A significant MANOVA was preceded by discriminant analysis, namely, the analysis of variance, to examine group differences (Stevens, 2002).

Finally, we performed binary logistic regression and multiple hierarchical regression analyses to verify whether students' perceptions of the motivational climate in PE (mastery and performance) were predictors of participation in extracurricular activities and grades, respectively. In these two statistical techniques, the perception of the motivational climate oriented toward mastery was first inserted into the equation, followed by the perception of the motivational climate oriented toward performance, since both variables can influence behavior within the contexts of PE and sport.

Results

Validation of EPCM

Only 399 students from the entire sample were involved in the validation of the EPCM, 51.6% of whom were male. Their average age was 13.37 years ($SD = 0.93$). Preliminary analysis showed that none of the items presented values of asymmetry and kurtosis that, according to Marôco (2014), suggested severe violations of the normal distribution ($|Sk| > 3$ and $|Ku| > 10$). Regarding multivariate normality, the Mardia coefficient was 26.52, which is lower than the criterion stated above from Bollen's (1989) perspective.

We found that the EPCM model had poor fit quality ($\chi^2/df = 3.25$, $GFI = .88$, $CFI = .88$, $NFI = .85$, $TLI = .85$, $RMSEA = .09$, $RMSR = .09$). Therefore, to improve the model's quality of adjustment, we eliminated 30 observations whose D^2 values were outliers ($p1$ and $p2 < .001$) from the CFA. It should be emphasized that trajectories of the item pairs that included the same factor were included in the model, namely 1 and 6, 6 and 11, 1 and 11 (pursuit of progress by pupils), 3 and 8 (promotion of learning by teachers), and 4 and 17 (promotion of comparison by teachers). After conducting this analysis, an adequate adjustment quality of the model was obtained ($\chi^2/df = 2.9$, $GFI = .91$, $CFI = .91$, $NFI = .88$, $TLI = .90$, $RMSEA = .06$, $RMSR = .08$). The quality of adjustment recorded in our study was slightly better than that of the original model ($GFI = .86$, adjusted $GFI = .82$, $RMSEA = .08$, $RMSR = .09$).

In Table 1, the standardized factorial weights (λ), individual reliability of items (λ^2), FC, and AVE are presented. All items show factorial weights higher than .50, a value considered acceptable (Hair et al., 2018), so they have factorial validity. The four dimensions of the EPCM demonstrated high FC (> 0.70) and convergent validity ($AVE > 0.50$). However, the factor for the "Promotion of comparison by teacher" showed relatively fragile values ($FC = 0.69$; $AVE = 0.38$). Regarding discriminant validity, we found that the correlation between the squared factors was lower than the AVE values for each factor and concluded that the factors differed from each other.

Students' Perceptions of the Motivational Climate in PE

Descriptive data concerning students' perceptions of the motivational climate in PE according to their level of education, gender,

Table 1 Standardized Factorial Weights, Individual Item Reliability, FC, and AVE From EPCM Dimensions

Factors	Item	λ	λ^2	FC	AVE
Pupil's pursuit of progress	1	0.72	0.52	0.86	0.54
	6	0.70	0.48		
	11	0.77	0.59		
	15	0.78	0.61		
	19	0.77	0.59		
Teacher's promotion of learning	3	0.79	0.62	0.89	0.63
	8	0.77	0.59		
	13	0.87	0.75		
	16	0.87	0.75		
Pupil's pursuit of comparison	2	0.67	0.46	0.77	0.52
	7	0.73	0.53		
	12	0.63	0.39		
Teacher's promotion of comparison	4	0.68	0.47	0.69	0.38
	9	0.63	0.39		
	17	0.62	0.38		
Worrying about making mistakes	5	0.66	0.44	0.72	0.51
	10	0.69	0.47		
	14	0.70	0.49		
	18	0.56	0.31		

Note. λ = standardized factorial weight; λ^2 = individual item fidelity; FC = composite reliability; AVE = average variance extracted; EPCM = L'Echelle de Perception du Climat Motivational.

and SES are shown in Tables 2 and 3. Regarding grade levels, it was found that students in Grade 7 had an average score of 4.25 ($SD = 0.707$) on items centered around the mastery orientation scale, those in Grade 8 had a score of 4.35 ($SD = 0.571$), and those in Grade 9 had a score of 4.15 ($SD = 1.03$). On the performance orientation scale, students in Grade 7 received an average score on the items of 3.53 ($SD = 0.520$), those in Grade 8, 3.42 ($SD = 0.563$), and those in Grade 9, 3.37 ($SD = 0.535$). Male students achieved an average score of 4.22 ($SD = 0.754$) on the mastery scale items, while female students scored 4.35 ($SD = 0.690$). On the performance scale, the average score for male students was 3.45 ($SD = 0.570$), and for female students, it was 3.44 ($SD = 0.521$), which are relatively similar scores.

Regarding students' SES, the average scores of the students on the mastery scale were 4.17 ($SD = 0.535$), 4.34 ($SD = 0.535$), and 4.38 ($SD = 0.535$), from lower-, middle-, and higher-income families, respectively. Therefore, the average values on the performance scale of students from various SES groups were approximately the same.

We examined students' perceptions of the motivational climate in PE. Using the Student's t test, we found that they had a significantly higher perception of the motivational climate in PE for mastery than for performance ($t = 23.82$; $df = 475$; $p < .001$). We also analyzed variations in students' perceptions of the motivational climate in PE according to sociodemographic variables (level of education, gender, and SES). The results of the MANOVA (see Table 4) showed that the level of education had a statistically significant effect, Wilk's lambda = 0.979, $F(4, 914) = 2.398$, $p < .05$, $\eta_p^2 = .01$, and SES, Wilk's lambda = 0.962, $F(4, 914) = 4.516$, $p < .01$, $\eta_p^2 = .019$. However, gender did not influence the students' perceptions of the motivational climate in PE.

With regard to the level of education, the subsequent analysis of variance revealed that the effect of this variable only manifested in the performance-oriented climate, $F(2) = 3.031$, $p < .05$, $\eta_p^2 = .13$. The Tukey-Kramer post hoc test showed that students in Grade 7 scored significantly higher on the performance-oriented climate perception scale than did students in Grade 9.

Regarding SES, analysis of variance showed that the effect of this variable was only seen in the perception of the motivational climate oriented toward mastery, $F(2) = 8.274$, $p < .01$, $\eta_p^2 = .35$. The Tukey-Kramer post hoc test indicated that students of medium SES obtained a significantly higher score on the climate oriented toward mastery than those from lower SES.

Table 5 shows the results of the binary logistic regression analysis of extracurricular sports participation. As can be seen, only the perception of the motivational climate oriented toward mastery had a significant predictive capacity for extracurricular sports participation (odds ratio = 1,886; 95% confidence interval [1.429, 2.491]). Students with greater mastery-oriented perceptions were 1.89 times more likely to be involved in extracurricular sports.

We conducted a hierarchical multiple regression analysis to determine whether students' perceptions of the motivational climate were predictors of their PE grades. In this analysis, PE grade was the dependent variable, and perception of the motivational climate was the independent variable. First, only the mastery climate variable was used. The performance climate variable was added in the second phase. The results in Table 6 show that the only positive and significant predictor was the perception of a mastery climate ($\beta = 0.15$, $p < .001$, adjusted $R^2 = .022$), which explains 2.2% of the variation in students' PE grades. The second phase showed that performance climate was not a significant predictor of students' PE grades ($\beta = 0.15$, $P = .097$, adjusted $R^2 = .020$).

Discussion

One of the objectives of this study was to validate the Portuguese version of the EPCM. The CFA results support the original structure of the instrument. The model consisted of two second-order factors and five first-order factors with adequate adjustment indices. These data corroborate the original study (Biddle et al., 1995) as well as those conducted in other countries (Escartí & Gutiérrez, 2001; Gutiérrez et al., 2018; Standage et al., 2003a, 2003b). It is important to note that outliers were removed from the data. The adjustment quality indicators were similar to those observed by Biddle et al. (1995).

The analysis of convergent validity was also satisfactory. However, the "Promotion of comparison by teacher" factor revealed FC and fragile AVE. The scale was also found to have adequate discriminant validity since the correlations between the squared factors were lower than the AVE values of each of these factors, demonstrating that they are distinct. Our results suggest that the Portuguese version of the EPCM has adequate validity and reliability. Therefore, it can be used to assess the motivational climate of PE for high school students and compare the data gathered across different countries and cultures. This is an important contribution to the field, as researchers can assess students' perceptions of the motivational climate in PE in a Portuguese context. This could influence teacher training and policies and prompt stakeholders to better understand teaching practices and the importance of quality in teaching PE.

Table 6 Hierarchical Multiple Regression Analysis With Variations on Students' Grades per Their Perceptions of Motivational Climates

Variables	Standardized beta coefficient	R ² change	Total R ²	F change (1, 473)	p
Phase 1					
Mastery climate	0.155	.022	.024	11.695	.001
Phase 2					
Mastery climate and performance climate	0.156	.020	.024	5.836	.097

also influence the motivational climate as more oriented toward mastery or performance. This could be a possible explanation for why students in Grade 7 perceive a more performance-oriented climate than their counterparts in Grade 9. Furthermore, students might change their perceptions of the motivational climate by systematically engaging in more performance-oriented climates, which may be the case in the present study.

Concerning gender, the findings highlight that this variable did not influence students' perceptions of the motivational climate in PE. Our findings do not corroborate many previous studies in which significant differences were found between male and female high school students regarding their perceptions of the motivational climate in PE (Bakirtzoglou & Ioannou, 2011; Moreno-Murcia et al., 2011; Tidmarsh et al., 2022). Specifically, previous studies have shown that male students perceive a more performance-oriented climate, while girls perceive a more mastery-oriented climate. Cultural variables, the quality of developmental opportunities provided to youth, and the nature of the PE curriculum could explain these findings (García-González et al., 2019; Hastie et al., 2013).

Regarding the influence of students' SES on their perceptions of the motivational climate in PE, we found that students from middle-income families perceived PE classes oriented toward mastery more than those from lower-income families. The lack of studies analyzing the relationship between these two variables makes it difficult to interpret students' perceptions of the motivational climate. Nonetheless, the culture, lack of equity, and opportunities provided to youth may help justify these findings. Policymakers and teachers should strive to facilitate an inclusive environment in PE, where quality experiences are ensured for all youth, especially by considering their needs in contemporary society due to the COVID-19 pandemic (Hastie et al., 2013; Whitley et al., 2021).

One of the main objectives of this study was to analyze the relationship between students' perceptions of the motivational climate in PE and extracurricular sports participation and grades in PE. Our results suggest that a climate oriented toward mastery is a positive predictor of student participation in extracurricular sports. In fact, students with a mastery-oriented perception were 1.89 times more likely to be involved in extracurricular sports. Previous studies have focused on the influence of the motivational climate on students' intention to play sports and to be physically active, showing that a mastery climate is positively associated with these variables (Cid et al., 2019; Escartí & Gutiérrez, 2001; Sproule et al., 2007). These findings support the idea that the motivational climate in PE influences participation in extracurricular sports, which may have a positive impact on PA levels and motivation toward lifelong sports participation (Belton et al., 2017; De Meester et al., 2017). The perception of a climate oriented toward mastery was also found to be a positive predictor of students' grades in PE, explaining, however, a very modest amount of the variance (2.2%).

Future studies are necessary to determine whether the motivational climate in PE influences students' participation in extracurricular sports and PE grades. We should also bear in mind that this study used a nonprobability sampling method, which may explain our findings. Other sampling techniques may shed light on how specific teaching practices influence students' perceptions of the motivational climates. It would be useful to delve deeper into how students' perceptions of the motivational climate could be influenced by teaching practices more than by other variables such as gender and SES. Longitudinal studies may also enable an understanding of the relationship between motivational climate, sports participation, and PA levels throughout compulsory education. Future research could examine differences in the curriculum between Grades 7 and 9 using qualitative methods to explore students' perceptions of the appropriateness of the content and the quality of developmental experiences provided by PE. Nonparticipation in extracurricular sports in high school does not mean that students are physically inactive outside school. Future research could map extracurricular sports and students' PA levels and compare the perceived motivational climate created by PE teachers with the climate created in extracurricular sports.

Research has shown that the creation of a climate that is oriented toward mastery represents an effective strategy to increase students' motivation for learning but also provides a greater likelihood of students engaging in extracurricular sports (Baena-Extremera et al., 2015; Cid et al., 2019). Digelidis et al. (2003) showed that PE teachers can deliberately create a positive motivational climate in PE through concrete pedagogical strategies, such as promoting students' intrinsic motivation, not overemphasizing competition or competitive activities, encouraging and valuing students' progress, reinforcing the orientation toward students' tasks, creating learning situations in which effort and support from peers are rewarded, and ensuring that students feel like they have an active role to play (Digelidis et al., 2003; Escrivá-Boulley et al., 2018; Fernandez-Rio et al., 2014; Moreno-Murcia et al., 2018). Therefore, learner-centered approaches (Hastie et al., 2013; Kirk, 2006) may help PE teachers design quality PE programs and create a motivational climate that fosters students' perceived competence, which may subsequently lead to continued participation in extracurricular sports and increased PA levels.

Conclusion

The present study may provide a valuable contribution to the Portuguese education system and to researchers interested in understanding the effectiveness of PE programs. However, this study has certain limitations. The climate oriented toward mastery in PE has emerged as a modest, albeit significant, predictor of participation in extracurricular sports and grades in PE. Therefore, caution must be exercised when interpreting these results. Another

limitation is that this study used a convenience sample that covered only a part of the country (i.e., the northern and central areas). This means that the sample is not representative of the entire Portuguese high-school population and system. Finally, in high school, sports participation could be more aligned with a performance climate, which may have impacted our findings.

Nonetheless, our findings show that students' perceptions of the motivational climate vary depending on their educational level and SES. It is important that PE teachers consider education level when developing strategies to foster a motivational climate that is oriented toward mastery. The finding that the motivational climate is a predictor, albeit a modest one, of extracurricular sports participation and PE grades constitutes an empirically supported theory (Ames, 1992a) that has highlighted the relevance of the motivational climate in sports participation throughout the students' lives, as well as its influence on learning. This study broadens our knowledge of the importance of motivational climate in extracurricular sports participation and PA levels, which is the ultimate objective of PE, and provides a resource for researchers to describe the motivational climate in Portuguese PE. We hope that this study will prompt other researchers in Portugal and elsewhere to study the motivational climate of PE, and that it will provide insight for the development of both policy and practice.

Acknowledgments

This work was supported by National Funds through the Fundação para a Ciência e a Tecnologia, I.P., under the scope of the project UIDB/05198/2020 (Centre for Research and Innovation in Education).

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