UNIVERSIDADE
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Students' Attitudes and Motivational Climate in Physical Education: Implications for Engagement in Community Youth Sport

Paulo Alberto da Silva Pereira

Tese para obtenção do Grau de Doutor em
Ciências do Desporto
(3º ciclo de estudos)

Orientador: Professor Doutor Daniel Almeida Marinho

Março de 2026

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CARTÃO DE CIDADÃO

Dedicatory

To my parents and daughter

Acknowledgments

This thesis became a reality because I had the privilege of being supported and challenged by several people. To all of them I would like to express my deepest gratitude.

To Professor Daniel Almeida Marinho for the availability and openness through which he guided his supervision of the present thesis, for the relevance of the points made, suggestions, critiques, as well as for the confidence and support provided throughout every step of the way.

To Fernando Ferreira Santos for contributing with his knowledge, friendship and constant support to enable the development of this thesis.

To physical education teachers who willingly and altruistically volunteered to partake in this thesis showing a high level of professional responsibility and openness to collaboration in research.

To administrators of the schools where this research took place for collaborating, as well as for their generosity and understanding showed throughout every step of the process.

To students for their availability and generosity to participate in this research endeavor.

To all family members, colleagues and friends who always knew how to encourage me.

List of Publications

Pereira, P., Santos, F., & Marinho, D. A. (2026). Motivational climate and attitudes towards physical education: Implications for student engagement in community youth sport. *Canadian Journal of Educational and Social Studies, 6*(1),161-182. https://doi.org/10.53103/cjess.v6i1.444

Pereira, P., Santos, F., & Marinho, D. A. (2024). Validation of the sport motivation scale-II: implications for the Portuguese youth sport system. *Sage Open, 14*(1). https://doi.org/10.1177/21582440231218512

Pereira, P., Santos, F., & Marinho, D. A. (2023). Portuguese students' perceptions about the motivational climate in physical education. *Journal of Teaching in Physical Education, 42*(2), 313-322. https://doi.org/10.1123/jtpe.2021-0149

Pereira, P., Santos, F., & Marinho, A. D. (2022). Students' attitudes toward physical education: a narrative review. *The Physical Educator*, 79(3), 330-350. https://doi.org/10.18666/TPE-2022-V79-I3-10696

Pereira, P., Marinho, D. A., & Santos, F. (2021). Positive motivational climates, physical activity and sport participation through self-determination theory: striving for quality physical education. *Journal of Physical Education, Recreation & Dance*, *92*(6), 42–47. https://doi.org/10.1080/07303084.2021.1936307

Pereira, P., Santos, F., & Marinho, D. (2021). Is there a gap between research and practice? reflecting on the motivational climate and attitudes towards physical education. *Retos, 39,* 887-892.

Pereira P., Santos F., & Marinho D. (2020) Examining Portuguese high school students' attitudes toward physical education. *Frontiers in Psychology, 11,* 1-11. https://doi.org/10.3389/fpsyg.2020.604556

Resumo

Atitudes e Clima Motivacional dos Alunos em Educação Física: Implicações na Participação dos Jovens no Desporto Comunitário

A atividade física dos alunos nas aulas de Educação Física é insuficiente para atender às recomendações da Organização Mundial da Saúde. Portanto, é fundamental que os jovens pratiquem atividades físicas extracurriculares nos tempos livres e persistam nesta prática após a escolaridade obrigatória (i.e., quando já não têm a disciplina de Educação Física). Assim, um dos objetivos desta disciplina deve consistir em promover a aquisição de estilos de vida ativos. As atitudes dos alunos face à Educação Física e o clima motivacional nas aulas de Educação Física parecem ser variáveis-chave nas razões para a prática desportiva. Porém, são poucos os estudos que analisaram a relação entre essas variáveis. Neste sentido, o objetivo desta tese é analisar as relações entre as atitudes dos alunos face à Educação Física, a sua perceção do clima motivacional nas aulas da disciplina e os seus motivos para a prática de atividades desportivas em contextos extracurriculares. Os resultados mostram que: (i) Os alunos têm, de um modo geral, uma atitude moderadamente positiva em relação à EF; (ii) as atitudes positivas dos alunos face à EF variam em função do nível de escolaridade e do género dos alunos; (iii) uma atitude mais positiva em EF favorece a obtenção de melhores classificações nessa disciplina; (iv) os alunos percecionam as suas aulas de EF como sendo mais orientadas para a mestria do que para a performance; (v) os níveis de escolaridade e socioeconômico dos alunos parecem influenciar a perceção do clima motivacional nas aulas de EF; (vi) a perceção de um clima motivacional orientado para a mestria e uma atitude favorável face à EF surgem como preditores positivos na participação dos alunos em atividades desportivas extracurriculares; (vii) um clima orientado para a mestria em PE influencia o rendimento escolar dos alunos nessa disciplina; (viii) as versões portuguesas dos SAtPE, EPCM e SMS II constituem instrumentos com boas qualidades psicométricas de validade e fidedignidade para avaliar os alunos do ensino médio no contexto português. Estes resultados podem abrir caminho para uma Educação Física de maior qualidade e para o aumento da investigação neste domínio.

Palavras-chave

Pedagogia; jovens; desenvolvimento; motivação; desporto.

Abstract

Students' Attitudes and Motivational Climate in Physical Education: Implications for Engagement in Community Youth Sport

The physical activity carried out by students in Physical Education classes is insufficient to meet the recommendations recommended by the World Health Organization. Therefore, it is essential that young people practice extracurricular physical activities in their free time and persist in this practice after compulsory schooling, (i.e., when they no longer have the Physical Education subject). Hence, one of the objectives of this discipline must be to promote the acquisition of active lifestyles. Students' attitudes towards Physical Education and the motivational climate in Physical Education classes seem to be key variables in the reasons for practicing sports. However, there are few studies that have analyzed the relationship between these variables. In this sense, the purpose of this thesis is to analyze the relationships between students' attitudes towards Physical Education, their perception of the motivational climate in the subject's classes and their reasons for practicing sporting activities in extracurricular contexts. Findings showcase the following: (i) for the most part, students have a moderately positive attitude towards Physical Education; (ii) students' positive attitudes towards Physical Education differ depending on their school year and gender; (iii) a more positive attitude towards Physical Education facilitates a better grade in this discipline; (iv) students perceive Physical Education classes more as mastery-oriented than performance-oriented; (v) school year and socioeconomic status seem to influence perceptions towards the motivational climate in Physical Education; (vi) perceiving the climate in Physical Education as mastery-oriented and a positive attitude towards Physical Education are positive predictors of engaging in community youth sport programming; (vii) a mastery-oriented climate in Physical Education influences grades in Physical Education; (viii) the Portuguese versions of the SAtPE, EPCM and SMS II have appropriate psychometric properties in terms of reliability and validity and can enable scholars to assess the variables at stake in secondary schools within the Portuguese context. Taken together, these findings can pave the way for quality Physical Education programming and for conducting additional research within this line of inquiry.

Keywords

Pedagogy; youth; development; motivation; sport.

Resumen

Actitudes y Clima Motivacional del Alumnado de Educación Física: Implicaciones para la Participación Juvenil en el Deporte Comunitário

La actividad física de los estudiantes en las clases de Educación Física es insuficiente para cumplir con las recomendaciones de la Organización Mundial de la Salud, por lo que es fundamental que los jóvenes practiquen actividades físicas extraescolares en su tiempo libre y persistan en esta práctica después de la escolarización obligatoria (es decir, cuando finalicen la escolarización obligatoria). ya no tienen la asignatura de Educación Física). Por tanto, uno de los objetivos de esta disciplina debe ser promover la adquisición de estilos de vida activos. Las actitudes de los estudiantes hacia la Educación Física y el clima motivacional en las clases de Educación Física parecen ser variables clave en los motivos para practicar deporte. Sin embargo, existen pocos estudios que hayan analizado la relación entre estas variables. En este sentido, el objetivo de esta tesis es analizar las relaciones entre las actitudes de los estudiantes hacia la Educación Física, su percepción del clima motivacional en las clases de Educación Física y sus motivos para practicar actividades deportivas en contextos extraescolares. Los resultados muestran que: (i) Los estudiantes tienen, en general, una actitud moderadamente positiva hacia la EF; (ii) las actitudes positivas de los estudiantes hacia la educación física varían según su nivel educativo y su género; (iii) una actitud más positiva en EF favorece la obtención de mejores calificaciones en esta asignatura; (iv) los estudiantes perciben sus clases de educación física como más orientadas al dominio que al rendimiento; (v) el nivel educativo y socioeconómico de los estudiantes parece influir en la percepción del clima motivacional en las clases de EF; (vi) la percepción de un clima motivacional orientado al dominio y una actitud favorable hacia la EF surgen como predictores positivos de la participación de los estudiantes en actividades deportivas extracurriculares; (vii) un clima orientado al dominio en EF influye en el rendimiento académico de los estudiantes en esta materia; (viii) las versiones portuguesas de SAtPE, EPCM y SMS II constituyen instrumentos con buenas cualidades psicométricas de validez y fiabilidad para evaluar a estudiantes de secundaria en el contexto portugués. Estos resultados pueden abrir el camino a una Educación Física de mayor calidad y a una mayor investigación en este campo.

Palabras clave

Pedagogía; jóvenes; desarrollo; motivación; deporte.

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CHAPTER 3. Study 5

List of Abbreviations

PE	Physical education
TRA	Theory of reasoned action
TRB	Theory of planned behavior
RAM	Rational/ reasoned action model
SAtPE	Students attitudes toward physical education
SDT	Self-determination theory
OECD	Organization for economic cooperation and development
AMOS	Analysis of moment structures software
CFA	Confirmatory factorial analysis
GFI	Goodness of fit index
CFI	Comparative fit index
NFI	Normed fit index
TLI	Tucker-Lewis index
RMSEA	Root mean square error of approximation
RMSR	Root mean square residual
CR	Composite reliability
AVE	Average variance extracted
SPSS	Statistics Package for Social Sciences
PA	Physical activity
AGT	Achievement Goal Theory
EPCM	L'Echelle de Perception du Climat Motivational
SES	Socioeconomic status

Chapter 1. General Introduction

Physical Education's main objectives are the physical improvement of students and the acquisition of active lifestyles, as well as their personal and social development. This means that the aforementioned discipline should not only provide young people with substantial physical activity in their classes, particularly important for those who have low levels of daily physical effort (Hu et al., 2014), but also promote their participation in sporting activities outside of school (Constantinides & Silverman, 2018). However, the physical activities carried out in Physical Education classes are insufficient to meet the recommendations set by the World Health Organization (2010), requiring greater autonomous and extracurricular sports practice. In fact, the problems arising from reduced levels of physical activity and the increasingly sedentary behaviors of young people can currently only be alleviated or resolved by practicing extracurricular sports and adopting more active lifestyles in their free time (Sevil et al., 2016).

The literature has highlighted the influence of some variables on subsequent participation in physical activities outside the school context (Kingston et al., 2023). One of these variables is attitudes. These greatly influence what we do and can affect our personal lives (Phillips & Silverman, 2015). According to Eagly and Chaiken (1993, p. 1), attitudes can be understood as a hypothetical construct referring to “psychological tendency that is expressed in a favorable or unfavorable evaluation of a specific entity”. The development of positive attitudes towards Physical Education is currently a desirable and lasting objective of the physical education program. In this regard, it should be noted that several investigations show that students who develop positive attitudes towards Physical Education are more likely to participate in physical activities outside the school context (Silverman, 2017), as well as adopting active, healthy and long-lasting lifestyles (Fenton & Bastida, 2024).

Among the theoretical models that contributed to explaining how attitudes are important factors in predicting human behavior, the most notable are the theory of reflected action (Fishbein & Ajzen, 1975), the theory of planned action (Ajzen, 1985) and the model of rational action (Fishbein & Ajzen, 2010).

The overwhelming majority of research into student attitudes towards Physical Education has been carried out in the United States of America (USA) (Constantinides & Silverman, 2018; Silverman, 2017). In fact, there are few studies carried out on this topic in European countries, whose curricular contexts are different from those in the

United States. Studies carried out in this context reveal that students normally have favorable attitudes towards Physical Education, but these become less positive with increasing age (Constantinides and Silverman, 2018; Phillips & Silverman, 2015). However, it should be noted that a significant part of the investigations into students' attitudes towards Physical Education have been developed without being properly based on theoretical perspectives, nor using previously validated instruments. It is, therefore, important to continue research in this area in order to improve understanding of students' attitudes towards Physical Education, particularly the influence they may have on participation in extracurricular sporting activities, thus allowing them to value the subject and become adults with active lifestyles. Research has also shown that, within the scope of Physical Education, motivation is one of the fundamental variables to encourage involvement in the practice of extracurricular sporting activities and the adoption of active lifestyles (Rocamora et al., 2024).

In the field of Physical Education and sport, the theories that have facilitated the understanding of motivation in recent decades have been socio-cognitive theories (Roberts, 1992). One of these theories is the Achievement Goal Theory (AGT) (Ames, 1992; Nicholls, 1989). From this perspective, it is proposed that the motivational and well-being state of individuals can be influenced by both dispositional variables (ego or task orientation) and situational variables (social climates). One of the central aspects of this theory is that individuals use ego or task orientation to evaluate their success and personal competence. An individual is ego-oriented when they use normative references to evaluate their success and competence, that is, they consider themselves successful when they outperform their peers. Conversely, when individuals are task-oriented, they evaluate success and competence through self-referential processes, that is, success is defined by personal improvement (i.e., their own progress).

One of the key elements of this theory is the motivational climate (Jaakkola et al., 2015). According to Ames (1992), this climate refers to a psychological situational perception of the activity that directs an action’s objectives. In other words, it refers to the set of implicit and/or explicit signals perceived from the environment, through which the keys to success and failure are defined. The motivational climate has two perspectives, namely: task-oriented; and ego-oriented. It should also be noted that the motivational climate in Physical Education classes influences students' motivation and their attitudes towards this discipline, as well as sport and physical activities (Bryan & Solmon, 2012; Gutiérrez, Tomás, & Calatayud, 2018).

Another of the most widely used theories to examine the motivational processes of students in Physical Education is the so-called self-determination theory (SDT; Deci & Ryan, 1985, Ryan & Deci, 2007). SDT seeks to explain to what extent people are willing to pursue goals and challenges (Chen & Hypnar, 2015). One of the principles of this theory is that individuals have the desire to satisfy three innate and universal mediators to perform more autonomous behaviors in Physical Education classes: (i) autonomy needs (i.e., innate needs of individuals to regulate their own initiatives and actions); (ii) competence (i.e., need to feel competent, interact successfully with their surroundings); (iii) social relationships (i.e., interact with others and feel connected to others; Ryan & Deci, 2000). These three basic needs explain the regulation processes of individuals' behaviors, which ranges from non-self-determined behavior to self-determined behavior: amotivation (absence of intention to act); extrinsic motivation (which encompasses four types of regulation - integrated, identified, introjected and external); commitment to an activity more for the consequences than for the activity itself; and intrinsic motivation (involvement in an activity for the pleasure one obtains from performing it).

The essential difference between AGT and SDT lies fundamentally in the fact that the first theory advocates that the main reason for human behavior is to demonstrate competence, while the second suggests that, together with competence, the perception of autonomy and social relationships are also important foundations for an individuals' psychological growth and well-being (Jaakkola et al., 2015).

Therefore, the present thesis intends to analyze the prediction of young people's motivation to practice extracurricular sporting activities through attitudes towards Physical Education and the perception of the motivational climate in this subject's classes. In order to clarify this problem, the purposes of this thesis are the following:

1. Characterize the state of the art in relation to students' attitudes towards Physical Education and the motivational climate in this subject's classes;

2. Carry out a narrative review of the literature regarding existing research needs within the scope of the study of the motivational climate and attitudes towards Physical Education;

3. Translate and validate a scale to assess students' attitudes towards Physical Education, another on the motivational climate in Physical Education classes and, finally, a scale on the reasons for practicing extracurricular sports;

4. Analyze students' attitudes towards Physical Education, as well as its influence on participation in extracurricular sporting activities. Additionally, we will seek to verify the variation in students' attitudes depending on sociodemographic variables (education level, socioeconomic level and gender) and academic performance in the subject (classification obtained in Physical Education);

5. Examine students' perception of the motivational climate in Physical Education classes, as well as its impact on participation in extracurricular sporting activities.

Subsequently, the analysis of the relationship between sociodemographic variables (education level, socioeconomic level and gender) and academic performance in the subject (classification obtained) of students and their perception of the motivational climate in Physical Education classes is also considered;

6. Verify the impact of students' attitudes towards Physical Education and the perception of the motivational climate in the subject's classes on the reasons for practicing extracurricular sports.

It should be noted that the objectives previously presented reflect a deductive logic of the various studies included in this thesis. Therefore, in study 1 of the present thesis narrative reviews of students' attitudes towards Physical Education and the motivational climate in physical education classes will be conducted. In studies 2, 3, 4 and 5 the aim is to validate measures to assess attitudes towards Physical Education and motivational climate, as well as attempt to provide answers concerning the objectives 3, 4, 5 and 6.

Chapter 2. Literature Review

Study 1

Students' Attitudes and Motivational Climate in Physical Education

1. Students' attitudes toward physical education: A narrative review

Abstract

In recent years, there have been more studies on students' attitudes toward physical education (PE). Such interest has derived from the increased levels of physical inactivity and obesity, which have been associated to the quality of PE. This narrative review aims to reflect on current research trends in students' attitudes toward PE and to identify future areas for research in this field. The last two decades of research on this topic have increased our knowledge about students' attitudes toward PE and enhanced our understanding of the strategies that can enhance student development. Future research could focus on (1) validating instruments for measuring students' attitudes toward PE, (2) defining the theoretical framework used, and (3) evaluating the effectiveness of educational systems.

Keywords:

Attitudes; youth; motivation; physical activity; development.

Introduction

Attitudes greatly influence what we do and how we value specific experiences in our lives (Phillips & Silverman, 2015). Attitudes can be understood as "a predisposition to respond in a favorable or unfavorable way to an object, person, institution, or event" (Ajzen, 1988, p. 4). According to Silverman (2017), differences in attitudes reflect the diversity of opinions and feelings individuals have toward a wide range of issues, such as the importance of physical education (PE).

In recent years, there has been increased research on students' attitudes toward PE and the influence of students' attitudes on their participation in extracurricular sport and physical activities (Chung & Phillips, 2002; Koca & Demirhan, 2004; Li et al., 2014; Ntovolis et al., 2015; Silverman & Subramaniam, 1999; Subramaniam & Silverman, 2000). In most developed countries, PE is a compulsory curricular subject with objectives aimed at helping students master sporting skills; fostering physical development (i.e., physical conditioning); and promoting student engagement in active, healthy, and long-lasting lifestyles that involve long-term participation in sport and physical activity (Rosado, 2009; Young et al., 2021). For Marttinen et al. (2018), the main goal of PE is to teach children and youth healthy lifestyles that allow them to remain physically active throughout their lives. However, in many cases, athletics and physical activities in PE classes do not satisfy the recommendations of the World Health Organization (Bull et al., 2020). Some advocate for increasing the number of hours spent in PE classes to enable autonomous extracurricular sports (Larouche et al., 2015; Stratton et al., 2008). Thus, the problems arising from the low levels of participation in physical activities and the increasingly sedentary behaviors of young people today can only be reduced and/or solved with strategies that foster students' engagement in active, healthy, and long-lasting lifestyles (Landolfi, 2014; Sevil et al., 2016).

Accordingly, the relevance of developing positive attitudes toward PE has been acknowledged and considered a critical goal to achieve over the coming decades (Sevil et al., 2016). In fact, the literature has shown how the development of positive attitudes toward PE can help young people engage in physical activities outside of school, as well as promote an active lifestyle throughout adolescence (Hagger et al., 2003; Haible et al., 2019; Harris, 2014; Mckenzie, 2003; Solmon & Lee, 1996) and adulthood (Kohl & Hobbs, 1998; Subramaniam & Silverman, 2007). Indeed, several studies have shown

that students' attitudes toward PE can change through meaningful experiences, relationships and increased self-efficacy (Digelidis et al., 2003). In this sense, PE teachers can play an important role in promoting positive attitudes about PE by using appropriate pedagogical strategies, curriculum, instructional models, and teaching styles (Digelidis et al., 2003; Subramaniam & Silverman, 2000; Zeng et al., 2011). However, research must address the connection between quality PE settings and increased levels of physical activity or sport participation over a lifetime. Such a premise requires an ecological approach that situates what we already know and what we need to know moving forward.

In this section, we conducted a narrative review focused exclusively on students' attitudes toward PE in elementary school (students between 7 and 11 years old), middle school (students between 12 and 14 years old), and secondary school (students between 15 and 18 years old). Although PE is compulsory, these contexts are crucial and may enhance our understanding. It is important to emphasize that other reviews (Silverman & Subramaniam, 1999; Silverman, 2017) have taken a different approach. Silverman and Subramaniam (1999) focused on the need to create and validate instruments that allow researchers to assess students' attitudes toward PE. On the other hand, Silverman (2017) analyzed students' and teachers' attitudes toward PE. Compared to Silverman (2017), we aimed to conduct a more detailed analysis of students' attitudes toward PE, including studies carried out in a vast array of contexts; we considered other variables, such as gender, socioeconomic status, and level of sports practice. Therefore, this narrative review aims to reflect on current trends of research in students' attitudes toward PE and to identify future directions for research in this field. Specifically, this review covers the measures used to assess students' attitudes, an overview of the main findings from previous studies, and implications for future research.

Prevalent Theoretical Model

Fishbein and Ajzen (1975), alongside other researchers (Ajzen, 1988; Fishbein & Ajzen, 2010), have made an important contribution to help conceptualize attitudes. Such conceptualization led to several reflections and discussions about the impact of attitudes on individuals' behaviors. According to Fishbein and Ajzen (1975), attitudes are important factors in predicting human behavior. This means that attitudes are not directly observable, but through them we can predict behavior. The theory of reflected action/theory of reasoned action (TRA) model developed by Fishbein and Ajzen (1975)

has evolved over three stages. Despite these nuances, all three stages consider that individuals seek and evaluate the information available to them to make decisions about present and future behaviors.

Initially, Fishbein and Ajzen (1975) developed the TRA (Figure 1). It was developed with the purpose of predicting and understanding individuals' behaviors (i.e., resulting from their conscious choices) as well as specifying the intention to perform a behavior (Fishbein & Ajzen, 1975).

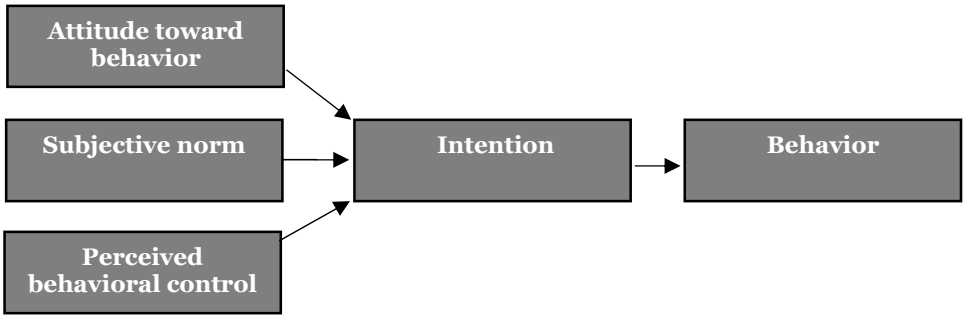
Figure 1. Theory of Reflected Action/Theory of Reasoned Action

Considering the premises of TRA (Fishbein & Ajzen, 1975), behavior is a balanced choice among several alternatives. Therefore, behavioral intention (dispositions that lead to a behavior) is the best predictor of actual behavior (Fishbein & Ajzen, 1975). A behavioral intention is determined by two important factors: (a) individuals' attitudes toward the behavior—personal influence on the behavior, representing the individuals' judgment toward achievement—and (b) the subjective norms—social pressures that affect the occurrence of a behavior; Fishbein & Ajzen, 1975). Within TRA (Fishbein & Ajzen, 1975), individuals' attitudes toward a behavior are the result of the sum of the individuals' beliefs about a certain behavior and the evaluation of the consequences of that same behavior. In contrast, subjective norms represent the sum of normative beliefs (i.e., expectations regarding the behavior) and the individual's motivation to adopt a behavior.

Ajzen (1985) modified and expanded the TRA to the theory of planned behavior (TPB; Figure 2). Ajzen (1985) considered TRA insufficient to explain certain behaviors. To the original model, Ajzen (1985) added a new behavioral determinant, perceived behavioral control (perceived difficulty in carrying out the behavior). According to this perspective, Ajzen (1985), the development of behavioral intentions results not only from attitudes toward a behavior and subjective norms but also from the perception of how difficult the behavior would be to implement. This means that the effect of

perceived behavioral control on the individual's behavior is fully mediated by intention (Head & Noar, 2013).

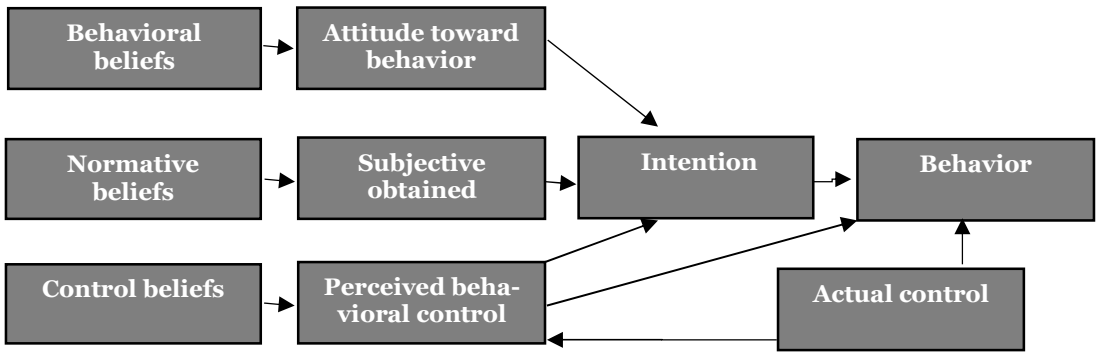
Figure 2. Theory of Planned Action/Theory of Planned Behavior



More recently, Fishbein and Ajzen (2010) developed the rational/ reasoned action model (RAM; Figure 3). They created this model to identify a restricted set of variables that could contribute to a substantial variation in any behavior (Fishbein & Ajzen, 2010). These variables include intentions, attitudes, the perceived norm, the perceived behavioral control, beliefs about a behavior (usually called cost-benefit or expected results), normative beliefs, and behavioral control (Silverman, 2017).

Within RAM, beliefs acquire a more prominent position and clearly influence the variables included in previous models (Silverman, 2017). In fact, behavioral beliefs influence attitudes, normative beliefs determine the perceived norm, and control beliefs influence perceived behavioral control. In this model, the subjective norm is now the perceived norm. This model is prevalent in most research on students' attitudes toward PE (Ajzen, 2012; Constantinides & Silverman, 2018; Mercier et al., 2017; Silverman, 2017).

Figure 3. Rational Action Model/Reasoned Action Approach



Research on Students' Attitudes Toward Physical Education

Instruments for Assessing Students' Attitudes Toward Physical Education

To assess students' attitudes toward PE, there are several instruments with appropriate psychometric properties (Subramaniam & Silverman, 2000). Among the main assessment instruments, those developed by Silverman and Subramaniam (1999) and Phillips and Silverman (2012) have been used in vast array of contexts (Mercier et al., 2017; Phillips & Silverman, 2015).

Subramaniam and Silverman (2000) developed the SAtPE (Students Attitudes Toward Physical Education). The SAtPE consists of 20 items (Subramaniam & Silverman, 2000). For each, the students decide their degree of agreement or disagreement on a 5-point Likert scale (1 = strongly disagree and 5 = strongly agree). Nine hundred ninety-five North American students from the sixth, seventh, and eighth grade participated in the validation study (Subramaniam & Silverman, 2000). This instrument is the most frequently used in the high school context (Constantinides & Silverman, 2018; Donovan et al., 2015; Mercier et al., 2017; Scrabis-Fletcher et al., 2016; Scrabis-Fletcher & Silverman, 2017).

In this instrument, attitudes are conceptually understood as a construct comprised of a cognitive component (perceived utility) and an affective component (pleasure). According to this structure, the affective component assesses the degree of emotional attraction or feeling toward an attitude, and the cognitive component refers to beliefs about the characteristics of the attitude (Subramaniam & Silverman, 2007). This means that in the SAtPE the affective component is related to aspects of fun or pleasure while cognition refers to the perceived importance or usefulness of the attitude (Mercier et al., 2017). Each of these components contains two subfactors, the teacher and the curriculum. Since it is difficult to measure perceived behavioral control, Subramaniam and Silverman (2000) used a two-component attitude model.

The SAtPE has also been validated in several countries, such as China (Hu et al., 2014), Cyprus (Constantinides & Silverman, 2018), and Serbia (Lazarević et al., 2015). Phillips and Silverman (2012) adapted and validated the SAtPE (Subramaniam & Silverman, 2000) instrument for elementary school students (fourth and fifth grades). This questionnaire includes 16 items on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Likewise, the instrument revealed adequate fidelity and validity for fourth- and fifth-year students (Mercier et al., 2017; Phillips & Silverman, 2015). Thus, to reinforce the notions conveyed in Silverman's (2017) review, there is the need for researchers to continue to validate measures that enable researchers to understand students' attitudes across sociocultural contexts and grade levels.

Findings From Research on Students' Attitudes Toward Physical Education

Research on students' attitudes toward PE has been developed mainly in the United States. However, in recent years, some studies have been carried out in several European and Asian countries (Constantinides & Silverman, 2018; Hu et al., 2014). Many researchers have been interested in verifying whether students have a positive attitude toward PE (Evangelou & Digelidis, 2018; Orlić et al., 2018). In general, studies carried out in the United States have shown that students have moderate to highly positive attitudes toward PE (Marttinen et al., 2018; Mercier et al., 2017; Montalvo & Silverman, 2008; Phillips & Silverman, 2015; Scrabis-Fletcher et al., 2016; Subramaniam & Silverman, 2000, 2007; Zeng et al., 2011). Although European and Asian countries have different traditions and curricular content, the work developed in these contexts had led to similar results. Indeed, the investigations carried out in China (Hu et al., 2014), Cyprus (Constantinides & Silverman, 2018), Greece (Evangelou &

Digelidis, 2018), Serbia (Lazarević et al., 2015; Orlić et al., 2018), and Turkey (Koca & Demirhan, 2004) have shown that students have an overall favorable to moderate attitude toward PE. Piéron (2005) pointed out that one of the reasons for this moderately positive attitude toward PE may be explained by the characteristics of PE itself. According to Piéron, PE has (unlike other academic disciplines) a more practical nature. There is greater freedom on the part of the student (i.e., possibility to make choices) and more opportunities for motor activity and play, which may explain these findings.

Other researchers have been concerned about the evolution of students' attitudes toward PE throughout compulsory education, that is, from elementary education to secondary education (Phillips & Silverman, 2015). Surprisingly, as Constantinides and Silverman (2018) stated, there are still few studies carried out in elementary education (i.e., students aged 7 to 11 years), at time when students are at a sensitive developmental stage and may start to develop motor skills and see PE as a fun, fulfilling, and intrinsically motivating discipline.

For instance, Phillips and Silverman (2015) designed a study to analyze elementary students' attitudes toward PE. One thousand three hundred forty-four North American students from the fourth and fifth grades participated in this study. The findings showed that the fourth-grade students had a significantly more positive attitude than the fifth-grade students. Phillips and Silverman (2015) suggested that the decline in attitude toward PE begins at a relatively early age. Constantinides and Silverman (2018), when examining 763 Cypriot students in fourth, fifth, and sixth grades, found that the younger students showed more favorable attitudes than the older ones. Constantinides and Silverman suggested that attitudes declined as the curriculum became less engaging and challenging.

With slightly different outcomes, the results of the Mercier et al. (2017) longitudinal study showed an increase in students' positive attitudes from fourth grade to fifth grade; thereafter, they decreased progressively. Generally, research carried out in the United States, Europe, or Asia suggests that students' attitudes toward PE becomes less positive as they move toward the end of their education (Evangelou & Digelidis, 2018; Hu et al., 2014; Lazarević et al., 2015; Marttinen et al., 2018; Mercier et al., 2017; Scrabis-Fletcher et al., 2016; Subramaniam & Silverman, 2000, 2007). However, among the various studies, there are differences in the grade level at which this decrease in favorable attitudes appears. In fact, several studies have said it is in the transition from fifth grade to sixth grade (i.e., the transition from elementary education

to middle education in the United States) that there is a significant decline in positive attitudes toward PE (Constantinides & Silverman, 2018; Mercier et al., 2017). Other studies have shown a decrease in later years, specifically in the seventh grade (Evangelou & Digelidis, 2018; Lazarević et al., 2015; Marttinen et al., 2018; Scrabis-Fletcher et al., 2016), eighth grade (Subramaniam & Silverman, 2000, 2007), and ninth grade (Hu et al., 2014). Notably, starting puberty can contribute to less favorable attitudes and studies have shown a similar decline in attitudes toward other curricular disciplines (Kim et al., 2014). In the literature, two reasons for this change are usually mentioned. One is related to the curriculum, particularly the repetition of the course content for PE classes (Carlson, 1995; Subramaniam & Silverman, 2007) and the perception that the curriculum is not useful (Constantinides & Silverman, 2018). The other reason is related to the varied cognitive and socioaffective development of students at different grade levels due to their diverse developmental needs (Subramaniam & Silverman, 2007).

There is little research into secondary education (students from 16 to 18 years old). Studies at this level of education have shown inconsistent results. In fact, while in some studies there was a decrease in students' attitudes toward PE (Evangelou & Digelidis, 2018), in others there was no decline (Orlić et al., 2018). Nonetheless, it is important to have in mind that students at this age become more autonomous and can commit to organized sports or choose extracurricular alternatives that have no physical activity at all. Such a decision may derive from the types of experiences they have been exposed to and inherently the PE curriculum, as well as their motor competence. Further, the resources available in public and private schools to engage students in quality PE may be distinct, which can influence the attitudes toward PE. These nuances may need to be further understood as an integrated system so that we can better explain the findings in studies such as Orlić et al. (2018).

Students' Gender and Attitudes Toward Physical Education

Research has highlighted the influence of students' gender on their attitude toward PE at different levels of education (Constantinides & Silverman, 2018; Phillips & Silverman, 2015). Most of the studies carried out in elementary education found no significant differences in attitudes toward PE between male students and female students (Constantinides & Silverman, 2018; Phillips & Silverman, 2015). However, by high school, there are differences. Thus, some investigations show that male students in

secondary school have a more positive attitude toward PE than do their female counterparts, which may be explained by the lack of meaningful opportunities provided to female students and, in turn, motor competence (Koca & Demirhan, 2004; Lazarević et al., 2015; Mercier et al., 2017). However, most studies did not find statistically significant differences in attitudes by gender, whether in high school (Hu et al., 2014; Marttinen et al., 2018; Orlić et al., 2018; Scrabis-Fletcher et al., 2016; Subramaniam & Silverman, 2000, 2007) or in secondary school (Orlić et al., 2018; Zeng et al., 2011), which may be explained by female and male students experiencing PE similarly and being offered the same developmental opportunities. This creates a complex scenario in which many variables still need to be further examined so that we can understand how female and male students develop their perception about PE and the extent to which the developmental opportunities provided by teachers vary.

Students' Socioeconomic Status and Attitudes Toward Physical Education

Curiously, students' socioeconomic context has not received much attention in research on this subject (Aktop, 2010; Zeng et al., 2011). In the Zeng et al. (2011) study that sampled 1,317 American ninth to 12th graders, there were no significant differences in students' attitudes toward PE based on the students' socioeconomic status despite the fact students were involved in five urban public-school districts. Only when asked if there "is a scientific basis for the value of education/physical activity" did middle-class students show a significantly higher scores than those from low or high classes. Multiple schools that serve different socioeconomic regions (suburbs, rural, and urban) may have access to the same facilities and, therefore, have similar attitudes toward their PE. However, students at different schools - some with better resources than others— might show differences. This research venue may need to be further explored.

The Influence of Sports

The relationship between students' attitudes toward PE and sport has been the subject of several studies across the United States and other countries (Hagger et al., 2003; Solmon, 2003; Stewart et al., 1991). Currently, there is sufficient research to suggest that the development of positive attitudes toward PE is a decisive factor for young people to remain active outside of school (Hagger et al., 2003; Solmon, 2003). The results of several investigations on this subject have been converging. Koca and

Demirhan (2004) evaluated Turkish secondary school students' attitudes toward PE based on those who practiced sports outside school and those who did not. They proved that male and female students who engaged in sport outside of school had more favorable attitudes toward PE than those who did not practice sport outside of school. Similarly, the Lazarević et al. (2015) study in Serbia found that high school students with better positive attitudes toward PE were more often involved in physical activities outside of the school environment. More recently, Orlić et al. (2018) also found, in another investigation in Serbia, that high school students who practiced sport outside of school had a more positive attitude toward PE than those who did not. These findings support the idea that positive attitudes toward PE can affect students' involvement in physical and sport activities outside of the school environment (Phillips & Silverman, 2015). However, more insight is needed so that we can understand how the quality of developmental experiences in sport also play a role in students' attitudes toward PE. We should bear in mind that this is a reciprocal relationship. Further, research could also explore the effects of collaborations between schools and sport organizations on students' attitudes toward PE.

The Influence of Contextual Variables

Attitudes are affected not only by students' profile but also by contextual factors (Phillips & Silverman, 2015). According to several authors (Mercier et al., 2017; Silverman, 2011; Subramaniam & Silverman, 2000), the teacher and the curriculum are two of the contextual factors that decisively influence students' attitudes toward PE. Luke and Sinclair (1991) concluded that the curriculum is the most important determining factor in the development of positive and negative attitudes toward PE. On the basis of the literature, we can say that several factors connected to the teacher and the curriculum contribute to the development of positive attitudes toward PE (Carlson, 1995; Luke & Sinclair, 1991; Marttinen at al., 2018; Mercier et al., 2017; Montalvo & Silverman, 2008; Orlić et al., 2018; Phillips & Silverman, 2015; Rikard & Banville, 2006; Scrabis-Fletcher & Silverman, 2017; Silverman, 2011; Subramaniam & Mercier, 2017; Subramaniam & Silverman, 2000, 2002, 2007).

First, it has been deemed crucial to provide students with meaningful and challenging PE experiences in which they can learn new activities and skills while being involved in appropriate levels of skill and appropriate levels of challenge. Second, it is equally important to develop activities that correspond to students' physical effort, motor

competence, and overall developmental needs. Third, it is also recommended to avoid repetition of content such as the same approach to teaching a sport being used year after year. This also includes increasing students' opportunities to learn various sports activities, consequently reducing their number during the school year. Fourth, appropriately calibrating competitive environments is also paramount. Students need to be engaged in a challenging and inclusive environment. Finally, there is the need to use relevant content that can be transferred out of school and that can influence students' lives more broadly such as encouraging participation in an after-school sport program. On the basis of these recommendations, the teacher plays a crucial role in mediating students' experiences in PE and positive attitudes toward PE (Phillips & Silverman, 2015). Teachers are particularly important in developing students' attitudes because they often select and implement the PE curriculum (Silverman, 2011). Therefore, it is necessary to understand how PE teachers conceive PE and operationalize these teaching principles.

Luke and Sinclair (1991) alluded to the notion that the teacher's behavior is the second most important determining factor in students' negative attitudes toward PE. According to these authors, the factors that most contribute to negative attitudes are the "evaluation methods" and "lack of opportunities to participate in decision-making." Several researchers have suggested that through several factors, the teacher can contribute to the development of students' negative attitudes toward PE (Constantinides & Silverman, 2018; Digelidis et al., 2003; Mercier et al., 2017; Orlić et al., 2018; Scrabis- Fletcher & Silverman, 2017; Siedentop, 1994, 2004; Silverman, 2011; Subramaniam & Silverman, 2002, 2007). Among these factors, it seems important to highlight the development of an ego-oriented motivational climate and teacher-centered models that do not provide an authentic sports environment wherein competition and inclusion are combined (e.g., sport education model) as well as the lack of maximization of time and students' motor engagement, which fosters fun and enjoyment. These nuances highlight the need to understand teacher education processes (i.e., how are teachers prepared to deliver sound programming?), school functioning (what are the guiding values, beliefs, and principles?), teaching practice (what are teachers teaching and how?), and students' attitudes toward PE as an integrated system.

Conclusion

This review examined research on students' attitudes toward PE, specifically considering a broad range of variables that could help situate current trends and identify future research directions. Such efforts may highlight the importance of encouraging participation in extracurricular physical activities as well as the role of context variables (e.g., curriculum, teacher education) in the development of quality PE programming.

Research on this topic is essential for teachers to verify whether students' attitudes are positive or negative and, subsequently, define the best pedagogical strategies to increase students' participation in PE classes, improve students' learning outcomes, and further encourage students' involvement in extracurricular physical activities and sport. Our review allows us to highlight several general conclusions about research on students' attitudes toward PE. Studies show that, in general, students have moderate to high attitudes toward PE. However, these positive attitudes tend to decrease as students' progress in schooling, particularly after puberty. Variables need to be considered concurrently for a better understanding about the quality of PE across sociocultural contexts. Thus, considering the existence of growing concern in several educational contexts toward PE, and in fostering involvement in sports and physical activities throughout life, this review allows researchers to understand the trends over recent decades, facilitating a prospective look at what needs to be further examined and studied. It is essential to reflect on the cultural relevance of PE and to gather knowledge to enable changes in educational systems and influence how PE is delivered.

Future Studies

Some variables, whether associated with students' profile or context, have an impact on students' attitudes toward PE. More specifically, research shows that participation in extracurricular sports activities, as well as certain contextual factors, such as the teacher and the curriculum, influence students' attitudes toward PE. It should be emphasized that the cultural relevance of PE—specifically the curriculum, PE teachers' practices, and students' attitudes should be explored in future studies to effectively develop ecological changes in various educational systems. It is essential that studies longitudinally track students' behaviors and understand how the curriculum can contribute to helping students adopt active lifestyles, whether during school or in adulthood. The development and study of students' long-term experiences can be explored with the aid of longitudinal research designs that include process variables (e.g., curriculum, PE teacher strategies) and product variables (e.g., student learning outcomes and accession to physical and sports activities, students' motor skills).

The last two decades of research on this topic have increased not only our knowledge about students' attitudes toward PE but also how we can use certain strategies to enhance student development. Moving forward, we need to focus on several lines of inquiry. First, the validation of instruments for the evaluation of the variable "students' attitudes toward PE" may allow for more rigorous studies to be conducted across age groups, grades, and contexts. Second, it is important to clearly define the theoretical model used and understand through deductive approaches how theory reflects practice. Further, developing new models and approaches that view attitudes toward PE as part of a larger system may impact the quality of PE programming. Finally, to evaluate the effectiveness of an educational system, researchers (and policy makers) may need to consider the need for longitudinal process–product designs wherein the relationship between curriculum, teacher education, teaching practice, among other context variables, and students' attitudes can be explored. Such designs may have the potential to foster sustainable educational changes.

The existent knowledge can be increased in realities where research on students' attitudes toward PE has been scarce. An ecological perspective that encompasses variables in the education system in an integrated way can help answer the research questions previously posed and can contribute to the existence of significant and sustainable changes in various education systems. The coming years of research may

generate enthusiasm and provide valuable contributions to the creation of a truly transformative PE.

2. Positive motivational climates, physical activity and sport participation through self-determination theory: Striving for quality physical education

Abstract

Physical activity levels and participation in sport-related activities is, in many cases, decreasing. This decrease has been associated with the quality of physical education, which in turn may be determined by the motivational climate. This section aims to provide practical applications, derived from self-determination theory, that may help teachers foster a self-determined motivational climate that leads to engagement in physical education, physical activity, and sport activities across age groups.

Keywords:

Motivation; youth; pedagogy; sport.

Introduction

Physical Education (PE) is a crucial context for students' motor, emotional, cognitive and psychological development across diverse developmental stages (Sallis et al., 2012). For example, researchers have attempted to understand how PE should be structured to contribute to young children's social and emotional learning (Moreno et al., 2019). In fact, PE, in many contexts across the globe, has shown to be responsible for many positive outcomes such as motor skill development, leadership development and lifelong participation in physical activity and sport (McLennan & Thompson, 2015; Sliwa et al., 2017). Thus, PE teachers face the challenge of helping students become intrinsically motivated to participate in PE (Quennerstedt, 2019; Reina et al., 2019) as well as physical activity and sport activities beyond the school environment (Fraser-Thomas et al., 2008). In other words, PE teachers help students develop a broad array of skills with the aim of enabling meaningful participation in PE, physical activity and sport throughout life (Escartí & Gutiérrez, 2001). This is the key objective of PE and one that has generated many discussions about how PE is and should be contributing to a healthy lifestyle, physical activity and continuous participation in sport (Wallhead et al., 2013).

Physical activity levels and participation in sport-related activities are, in many cases, decreasing (Biddle & Goudas, 1996). This decrease has been associated with the quality of PE (Escartí & Gutiérrez, 2001), which in turn may be determined by the motivational climate and how PE teachers create and provide for a solid foundation for students' meaningful participation in and outside PE (Jaakkola et al., 2017; Morgan, 2017). Quality PE needs to be assessed through the motivational climate experienced by students and the extent to which students are intrinsically motivated to participate in PE (Ennis, 2011). In this sense, physical fitness and motor skill development on their own are not sufficient to increase the likelihood of students engaging in physical activity and sport participation throughout the life span (Jung et al., 2018).

Brief Overview of Self-Determination Theory

Considering these premises, research and practice on motivational climate in PE has provided valuable insight on how PE teachers may provide a climate conducive to positive outcomes (i.e., physical activity and sport participation across the life span; Warburton, 2017). Several researchers have used multiple theoretical frameworks to better understand the challenges and practical implications related to promoting a self-determined motivational climate (Ames & Archer, 1988). One of these theoretical frameworks is self-determination theory (SDT), developed by Deci and Ryan (2008), which has been extensively used in many fields such as sport coaching and clinical psychology (Amorose & Anderson-Butcher, 2007; Patrick & Williams, 2012). In many cases, sport participation throughout the life span is seen as an outcome of a self-determined motivational climate instead of a component of quality programming (Cid et al., 2019). Thus, we acknowledge the need for PE teachers to develop strategies in both domains (i.e., meaningful PE, physical activity and sport participation) that ultimately may increase the support given to students and generate higher levels of participation in physical activity and sport.

This section aims to provide practical applications derived from SDT to generate a self-determined motivational climate that leads to engagement in PE, physical activity and sport activities across age groups. More specifically, strategies for teachers to foster a self-determined motivational climate in PE can be unrelated to the strategies teachers may use to engage students in physical activity and sport participation. This section aims to provide recommendations for PE teachers to tackle this challenge and enhance their efforts toward providing quality PE.

Applying self-determination theory to the physical education context

Self-determination theory is a theory of human development that emphasizes the importance of motivation quality (Deci & Ryan, 2008). More specifically, these researchers highlight that motivation could be considered within a continuum in which individuals might use diverse forms of regulation: amotivated, extrinsically motivated and intrinsically motivated. For example, a PE teacher may have students who are not motivated toward PE, physical activity and sport participation and develop specific strategies to help them become intrinsically motivated.

First, amotivation reflects a state in which students do not see value and meaning in PE but might have an interest in participating in various activities given how the environment is structured. Within this component of the continuum, students may refuse to participate in PE classes and become easily frustrated with activities, peers and the PE teacher. Second, an extrinsically motivated form of regulation involves four subtypes of regulation: (1) external regulation that may be described as a form of regulation in which students behave to attain a reward (e.g., students are motivated to participate in PE to achieve a grade); (2) introjected regulation, which implies that students act due to a sense of obligation (e.g., students need to attend PE classes because it is a part of the curriculum and otherwise they might fail); (3) identified regulation that is related to the value given to a specific goal, accomplishment and/or subject (e.g., attending PE because it is important to finish school and be a successful student); and (4) integrated regulation that reflects the connection of a behavior with other goals and values (e.g., participating in PE because it aligns with aspects of a healthy mind and body). Finally, an intrinsically motivated form of regulation, the final objective of PE, implies that students participate in PE because it is important for them (i.e., personal rewards) and increases their self-worth. Specifically, intrinsically motivated students will likely engage in physical activity and sport autonomously throughout life.

To move students along the continuum to become intrinsically motivated toward PE, it is necessary to consider three setting features. The context, in this case PE, should provide (1) a climate of autonomy, (2) quality relationships, and (3) opportunities for students to be competent and activities with similar skills and tactics that the students can relate to. For example, a teacher may create positive teacher–student interactions, value students' accomplishments, negotiate activities, and make sure that all students are learning, and their needs are considered. Self-determination theory may help PE teachers analyze (1) the setting features that may need to be included in programming to maximize developmental opportunities in PE and (2) students' forms of motivation toward PE, physical activity and sport participation beyond school. This may also provide necessary insight for PE teachers to develop specific strategies that assist each student in becoming intrinsically motivated in both domains.

The path toward students' intrinsic motivation in Physical Education

Considering the complex nature of helping students become intrinsically motivated toward PE, physical activity and sport participation beyond school, we suggest that PE teachers focus primarily on utilizing differentiated strategies in PE that may help students with diverse forms of regulation move along the SDT continuum. This implies that PE teachers systematically assess students forms of motivation toward PE, physical activity and sport (see Table 1 for a sample evaluation sheet). Concurrently, self-assessment is an important component because students may reflect on their motivation toward PE, physical activity and sport. Keep in mind that a student may be extrinsically motivated toward PE but nonetheless intrinsically toward sport participation due to a meaningful coach–athlete relationship, which highlights the need to consider these three contexts: PE, physical activity and sport.

Table 1. Sample evaluation sheet for teachers and students

Student	Physical Education	Physical Activity	Sport	Describe Challenges
	0-4	0-4	0-4	

Note: 0 – The student is not motivated; 1 – The student is motivated due to a due to a sense of obligation; 3 – The student is motivated because it aligns with aspects of a healthy mind and body; 4 – The student is motivated for personal rewards

Moving forward, PE teachers may then focus on assessing and providing support for students to become intrinsically motivated toward physical activity and sport participation beyond school in settings such as youth sport clubs and after-school physical activity clubs. Thus, we adapted the SDT continuum provided by Deci and Ryan (2008) to fit the PE contexts and teachers' ultimate objective of fostering autonomous physical activity and sport participation. It should be noted that these strategies are not exclusive and are presented as guidelines so that teachers from a wide range of contexts/ age groups can adjust and adapt them to best meet their PE program.

Amotivation

Students who are not motivated to participate in PE reflect some of the most important challenges PE teachers face (Braithwaite et al., 2011; Escartí & Gutiérrez, 2001). This could be because these students never engaged in physical activity and sport participation across the life span because of negative outcomes, such as their lack of motor proficiency and personal health problems (Sallis et al., 2012). To overcome these challenges, we suggest that PE teachers use the following strategies: (1) create opportunities to build students self-confidence, (2) engage in individual goal setting and process goals, and (3) manipulate activities to increase the success rate and provide choices (see Table 2 for examples of concrete ways to implement these strategies).

Table 2. Sample activities and strategies

Strategies	Physical Education	Physical Activity	Sport
Build students self-confidence	Value students' accomplishments and find their strengths. It is crucial to stimulate students to find activities they enjoy.	Engage with students in an activity during lunch break and play with them. Take time to praise them and try to challenge them to join a afterschool physical activity club that promotes outdoor activities.	Recruit an intrinsically motivated student and share the responsibility of engaging students in this stage of the continuum in a sport activity outside school. Value the fact students are able to try something new and monitor progress.
Individual process goals	Use the evaluation sheet described in Table 1 to set individual process goals. Value effort and work ethic constantly. Reorganize goals within individual meetings.		

Considering the first strategy presented, it is important to note that perceived competence (i.e., what students believe they are capable of) is key to enable students to become motivated to engage in PE (Ferrer-Caja & Weiss, 2000; Moreno-Murcia et al., 2011). In other words, students, in some cases, have negative experiences in PE, which creates barriers for their participation throughout the years spent in school (Cardinal et al., 2013). PE teachers could include opportunities to develop close bonds with students and understand their past experiences, beliefs and fears to understand how to frame their interventions. For example, the teacher may deliberately create moments before and/or after PE sessions for class assemblies and individualized support in an area designated "class locker room," and students may discuss their participation in PE,

physical activity and sport by providing examples of experiences, accomplishments and stories. Including students' narratives may help engage them in their own learning and reflect on their involvement in PE, physical activity and sport. These moments should not feel like an assessment but instead a group or individual reflection about students' experiences and ways of improving PE, physical activity and sport participation.

Learning in PE is essentially experiential in nature; however, some students need to be engaged so they can experience PE (Wallhead & O'Sullivan, 2005). Many PE teachers have faced the situation of having students stating their negative perception about PE and not participating in activities. Hence, the first step is to provide opportunities for students to be able to actively engage in PE. The other strategies presented previously highlight the need to carefully plan and operationalize activities to maximize perceived competence, choices and voices and positive relationships. Thus, PE teachers might also engage in individual goal setting and process goals. A focus on process goals (e.g., improve the level of effort in an activity) may help increase students' self-confidence and perceived competence. It is crucial to design activities that generate high rates of success and provide choices and voices within a positive environment.

Concerning sport participation, in some cases, due to factors such as pressure to perform, inappropriate team climate and a "performance at all cost" mindset, youth sport is a negative experience for some students (Fraser-Thomas et al., 2008). Therefore, PE teachers play a mediating role in helping students reflect on their experience in youth sport, defining appropriate expectations that consider developmental goals, and creating partnerships with youth sport clubs.

Partnerships with youth sport coaches may help attain a sense of coherency (i.e., similar strategies and pedagogical approach in both settings) and make sure that students' first experiences in youth sport are positive. These teacher–coach partnerships may create solid grounds for increased physical activity in adulthood. Thus, schools may establish formal partnerships with youth sport clubs and/or sport organizations that follow sound pedagogical principles (Fraser-Thomas et al., 2005) and facilitate students' transition to high-quality sport-based programs. We need to recognize the important role played by coaches in students' motivation towards PE, physical activity and sport (Merkel, 2013). Table 3 represents an evaluation sheet for students' that may help understand how they view teachers' and coaches' efforts.

Table 3. Students self-evaluation sheet

Student	Physical Education	Physical Activity	Sport	Perceived coach support	Perceived teacher support
	0-4	0-4	0-4	Yes/No	Yes/No

Note: 0 – I do not feel any changes in my motivation; 1 – I feel minor changes in my motivation; 3 – I feel some changes in my motivation; 4 – I feel many changes in my motivation

We reinforce the notion that these strategies imply that PE teachers potentially differentiate goals and strategies considering class sizes of 25 to 30 students (Colquitt et al., 2017). However, including all students and satisfying students' psychological needs is challenging. PE teachers simultaneously have to deal with students with other forms of regulation and need support to move along the SDT continuum.

Extrinsic Motivation

Considering the need to also consider students with other forms of regulation, including externally regulated motivation, PE teachers may use students' diverse needs to provide an inclusive and appropriate motivational climate for all. PE teachers may provide roles and responsibilities for externally motivated students to help them become intrinsically motivated and broaden their horizons in PE. This might include designing tasks that include amotivated students and providing leadership roles. For example, PE teachers might choose students who are the "coaches of the day" who will be responsible for helping amotivated students learn a skill. Leaders should be supported by the PE teacher and self-assess. Leadership development is, in many cases, a way of helping students find a sense of meaning.

This process could prompt conversations with students about individual motivations for PE within the class locker room. More specifically, students might be challenged to present an activity to the class, select a sport to be developed in PE lessons, and organize a tournament. Teachers could also provide opportunities for students to try a new sport or extracurricular activity and/or join an afterschool physical activity club. Using students' backgrounds and experiences might help them navigate the SDT continuum. For example, a student might have experience in climbing and the teacher

might invite him or her to share his or her knowledge and experience. This could lead to a climbing module. Curriculum ownership is a crucial part of an autonomy-based climate. Having students vote on what sport activities and contents they would like to see included in PE may contribute to their engagement. The teacher could ask students to complete a survey about the contents they would like to see included in PE, sports they would like to practice outside school, and physical activity habits. Then the teacher could negotiate decisions on the curriculum with students. The strategies mentioned in the previous stage of the SDT continuum still apply here.

Intrinsic Motivation

Although intrinsically motivated forms of regulation are considered great predictors of quality PE (Ferrer-Caja & Weiss, 2000; Li et al., 2008), it is key for PE teachers to maintain students at this stage of the SDT continuum. Thus, PE teachers could use strategies that help students become increasingly more responsible for their own learning and development in PE.

Thus, strategies could include using a mentorship program to prepare students to help others become competent, have a voice, and establish positive relationships within a positive and caring climate. For example, students may be responsible for helping another student in their class or a younger student. These efforts might include having the mentor (i.e., student in the leadership position) host a workshop focused on a sport, take time to play with the student during lunch break, and invite the student to participate in a practice at a local youth sport club. This approach may also include strategies that aim to provide roles and responsibilities beyond PE. For example, challenge a student to participate as an assistant coach in school sport.

Keep in mind that students may be intrinsically motivated to participate in PE but still not engage in sport beyond the school environment. Previous studies have mainly attempted to investigate the association between intrinsic motivation in PE and sport participation later in life (Cid et al., 2019; Escartí & Gutiérrez, 2001). Nevertheless, we recognize the need to provide concrete opportunities for sport participation beyond school as students become intrinsically motivated to engage in PE. The PE teacher has a crucial role in facilitating the transition from PE to sport beyond school through a step-by-step process. In this measure, it is crucial for PE teachers to create connections and partnerships with youth sport clubs and sport organizations to help set goals with

students that go beyond the PE classroom and into adulthood. This may include creating an after-school sport program. Another strategy that may be used by PE teachers is to monitor students' perceptions of sport participation and develop efforts that enable students to join a youth sport club or sport organization (see Table 3).

At this stage, PE teachers could help students set realistic goals about performance in sport. This implies students understanding sport as a holistic setting that conveys enjoyment and improvements in performance and health, among other positive outcomes (MacDonald et al., 2011). Teachers might also broaden students' horizons beyond competitive youth sport. More specifically, PE teachers could help students continue to increase their physical activity levels in various settings such as gyms or running groups and provide opportunities for students to try multiple sports. An evolving contribution of the PE teacher is to equip students with the necessary appreciation of engagement in long-lasting physical activity across the life span.

Conclusions

This section provides practical applications derived from SDT to generate a self-determined motivational climate in and outside of PE. We have attempted to provide some strategies for PE teachers to foster participation in PE and other sport-related activities beyond school. This step-by-step approach to fostering an intrinsically motivating climate may help PE teachers progressively move toward accomplishing one of the key objectives of PE, which is providing a solid foundation for permanent physical activity levels across the life span.

3. Is there a gap between research and practice? Reflecting on the motivational climate and attitudes towards physical education

Abstract

Over the last decades, motivational climate and students' attitudes towards physical education has been extensively discussed by the teaching community and investigated in many socio-cultural contexts. Nevertheless, in some cases, there are numerous discrepancies between research and practice due to the cultural relevancy of physical education across educational systems, policy and teachers' beliefs and practices. The purpose of this section is to analyze the existence of potential gaps between research and practice across socio-cultural contexts and suggest guidelines for future research and practice on motivational climate and attitudes towards physical education. In order to effectively create and disseminate knowledge, a broader focus on multiple contextual variables is needed which might help develop policies and evidence-based guidelines that reflect contextual intricacies across several socio-cultural contexts. In this article, we explore potential avenues for research and practice that might help increase our understanding about students' attitudes towards physical education through an appropriate motivational climate.

Keywords:

Education; youth; teacher; schools.

Introduction

Many researchers and practitioners such as Physical Education (PE) teachers (Merino-Barrero, Pedreño, Valenzuela, & Fernandez-Rio, 2019; Dyson, 2014; Sallis et al., 2012) have devoted their time and efforts to investigating how to foster quality of PE in several educational systems and countries. The need to foster quality PE drives for the increased levels of physical inactivity across the world, as well as lack of motor proficiency and intrinsic motivation towards this discipline (Onofre, 2017). Therefore, the quality of PE throughout childhood and adolescence is dependent on students' motivation towards physical and sport activities, motor competence and life skill development (McLennan & Thompson, 2015). However, applying these pedagogical principles and attaining these goals is not unproblematic. Such variables have motivated researchers to understand how to bridge the gap between research and PE teachers' practices for better student outcomes (Quennerstedt, & Larsson, 2015).

Conducting research-to-practice efforts that contribute to enhance the quality of PE is challenging, but indeed a priority for many stakeholders, organizations and researchers (Martinek & Ruiz, 2005; Wallhead & O'Sullivan, 2005). Such challenges include helping PE teachers adopt evidence-based practices, develop an appropriate curriculum, and consider communities and students' needs (Casey & MacPhail, 2018). McLennan and Thompson (2015) highlighted how quality of PE is not exclusively dependent on physical fitness and/or motor skill development. These researchers, alongside others (Santos, Neves, & Parker, 2020) alluded to the role played by PE teachers and school institutions to provide learning opportunities conducive to students' life skills development. Conversely, Onofre (2017) indicated PE teachers' and school institutions' roles and responsibilities to foster autonomous sport participation throughout the lifespan through an appropriate motivational climate. Therefore, the quality of PE encompasses multiple contextualized variables that reflect intended outcomes and need to be considered. Ferrer-Caja and Weiss (2000) have highlighted that investigating "…variations in motivated behaviors such as choice, effort, and persistence in physical activity is a primary objective of researchers and educators in the physical domain" (p.268).

Previous studies have stated the importance of fostering a motivational climate that provides students with high quality developmental experiences in PE that may (a) increase physical activity and sport participation through adulthood, (b) develop life

skills needed throughout the life span and (c) help overcome current societal challenges such as obesity and antisocial behaviors (Curtner-Smith, 1999; Hastie & Sharpe, 1999; Shek, Ma, & Sun, 2011; Jung, Ressler, & Linder, 2018; Quennerstedt, 2018). Achieving these developmental goals may also positively influence students' attitudes towards PE. This holistic approach towards PE has enabled an understanding about the role played by motivational climate and students' attitudes towards PE (Escartí, Gutiérrez, Pascual, & Wright, 2013).

Background

Several theories and postulates such as achievement goal theory and self-determination theory (Ntoumanis & Biddle, 1999; Deci & Ryan, 2008; Smith et al., 2015; Molina, 2018) have been used to understand the features of quality PE settings. As such, investigations have attempted to understand how to foster an intrinsically motivating environment in PE that may lead to long-lasting sport participation and increased levels of physical activity (Li, Wright, Rukavina, & Pickering, 2008). Further, students' attitudes towards PE have also been explored (Subramaniam & Silverman, 2007; Woodson-Smith, Dorwart, & Linder, 2015; Evangelou & Digelidis, 2018) to provide an understanding about students' positive and negative developmental experiences in PE. Thus, considering the influential role played by the motivational climate and attitudes toward PE in long term sport participation and physical activity (Morgan & Carpenter, 2002; Robertson-Wilson, Baker, Derbyshire, & Côté, 2003), reviews have been conducted to analyse the motivational climate in PE, interventions focused on changing students' attitudes towards PE, and/or rigor in previous research designs (Braithwaitea, Sprayb & Warburton, 2011; Silverman, 2017). Nevertheless, there is the need to critically reflect on the literature on motivational climate and attitudes towards PE to analyze the connection between research and the challenges placed by practice across socio-cultural contexts. This approach has numerous implications for researchers and stakeholders such as PE teachers and policy makers.

Despite the numerous calls for better PE across sociocultural settings that may enable sport participation and physical activity across the life span (Casey & MacPhail, 2018; Robertson-Wilson et al., 2003), research, in some cases, still has limited impact on PE teachers' practices. In some cases, such limited impact drives from the way research questions are framed and research priorities defined. First, we should have in mind that a range of variables influence PE differently across socio-cultural contexts. For

example, Jung and Wright (2012) examined the implementation of Hellison's (2011) model in South Korea and highlighted the challenges of fostering an autonomy-based climate due to the fact teachers were traditionally seen as "power controllers" (p. 155). Baptista et al. (2018) conducted an outcome evaluation of a teacher training program in Timor-Leste focused on Hellison's (2011) model. These researchers highlighted that the number of certified PE teachers in Timor-Leste is still lower than expected as more efforts should be directed towards teacher training. Second, there are variables beyond the motivational climate and students' attitudes towards PE that may need to be included in research designs if the aim is to ultimately improve PE teachers' practices and students' outcomes. The nature of PE teachers' practices and the challenges inherent to striving for quality PE may require a more holistic approach to research and practice (i.e., considering a vast array of variables such as teacher training and policy) across socio-cultural contexts. On one hand, researchers may need to reflect on how research projects are framed in their contexts and provide insight to solve real world problems. On the other hand, PE teachers may need to consider how to operate with the aim of improving the quality of PE in a sustainable manner. This debate may enable a better alignment between research and practice (Côté & Hancock, 2016) by helping PE teachers use evidence-based practices and researchers develop practice-based evidence.

The purpose of this section is to provide insights about potential gaps between research and practice across sociocultural contexts and suggest guidelines for future research and practice on motivational climate and attitudes towards PE. This section considers the experiences and reflections made by the authors within the Portuguese context and on the existent body of literature which may be useful for researchers and practitioners across a range of contexts.

Motivational climate research and attitudes toward physical education: What do we need to know?

Over the last decade, research on motivational climate in PE has provided valuable insight on how to provide solid grounds for meaningful participation in PE (Cid et al., 2019; Jaakkola, Yli-Piipari, Barkoukis, & Liukkonen, 2017; Liukkonen, Barkoukis, Anthony, & Jaakkola, 2010; Moreno-Murcia, Sicilia, Cervelló, Huéscar, & Dumitru, 2011). For example, Moreno-Murcia et al. (2011) conducted a study with 565 children from a Spanish setting that aimed to test a motivational model focused on the

relationships between situational and dispositional motivation and self-reported discipline. These researchers have alluded to the fact perceived motivational climate and students' motivational disposition are variables that may be used to predict self-reported discipline. More recently, Cid et al. (2019) conducted with 618 students from Portuguese public schools in order to understand the motivational climate, students' satisfaction of basic psychological needs as well as the role played by variables such as PE grades and intention to practice sport. Findings showed perceived competence had a positive relationship with students' autonomous motivation, PE grade and intention to practice sport. Most research has alluded to the notion that motivational climate influences students' perspectives toward PE and intention to perform sport and physical activity in the future through quantitative designs (Escartí & Gutiérrez, 2001; Morgan & Carpenter, 2002; Mendes, Martins, & Costa, 2006; Warburton, 2017). However, are students' perceptions about PE only a by-product of an appropriate motivational climate?

Several theories have been used by researchers to conceptualize motivational climate (Ames & Ames, 1984; Morgan, 2017). Of these theories, achievement goal theory has been largely used (Ames & Ames, 1984). Considering the work conducted by these researchers, achievement goal theory focuses on individuals' desire to attain competence through two types of objectives: task-oriented objectives and ego-oriented objectives. Task-oriented goals reflect an individual's desire to improve his/her performance, learn more and highlights the role played by individual improvement and an intrinsically motivating climate. In contrast, ego-oriented objectives outline the importance of outperforming others and have been linked to the lack of intrinsic motivation, low competence and ultimately lack of engagement in PE (Ntoumanis & Biddle, 1999). Thus, considering achievement goal theory's tenets, motivational climate has been considered either focused on mastery or competitiveness (Ames & Archer, 1988). Previous research (Escartí & Gutiérrez, 2001; Warburton, 2017) has shown that a climate of competitiveness may lead to negative outcomes (Valero, Martínez, & Botella, in press) such as less perceived competence when compared to a climate of mastery. Conversely, self-determination theory (Deci & Ryan, 2008) has also been utilized to understand students' motivation towards PE (Chirkov, 2009; Salazar-Ayala & Gastélum-Cuadras, 2020). This theory considers motivation within a continuum whereas students' move from being extrinsically to intrinsically motivated towards PE (Deci & Ryan, 2008). Indeed, intrinsically motivated students may have increased chances of participating in sport and physical activity throughout adulthood (Villarino, Valeiro, Reboredo, & Costa, 2017; Cid et al., 2019).

Positive attitudes toward PE have suggested an increased likelihood of sport participation across the life span (Biddle & Goudas, 1996; Subramaniam & Silverman, 2007). The two-component view of attitude is a framework that has been largely used in previous studies (Evangelou & Digelidis, 2018; Kaj et al., 2015; Woodson-Smith et al., 2015). This framework focuses on two components: cognition and affect. On one hand, cognition refers to students' beliefs, feelings and perspectives towards PE and reflects the perceived value of PE. For example, a student might feel PE helps improve physical fitness. On the other hand, the effect has been linked to students' expressions of feelings towards PE and their evaluation of this discipline. A student might feel the PE teacher does not provide appropriate support to improve physical fitness. Thus, attitudes toward PE directly influence students' behaviors and reflect how PE teachers are able to foster sport participation outside the school environment. Constantinides and Silverman (2018) conducted a study to examine the attitudes toward PE of 763 Cypriot students with ages ranging from 10 to 12 years and found the curriculum is viewed as less useful as students move to other grades. Findings showed there was a decrease in students' perceived usefulness of the PE teacher and curriculum (i.e., cognitive component) as the grade increased. Reina, Hutzler, Iniguez-Santiago, and Moreno-Murcia (2019) analyzed associations between students' ability beliefs and attitudes toward inclusion within the Spanish context. These researchers found that students with higher scores for ability beliefs had a less positive attitude toward inclusion in PE. Mohammed and Mohammad (2012) aimed to examine 2700 students' attitudes towards PE in Kuwait. Findings showed students believed PE was conducive to health benefits and provided a fun and positive atmosphere. Further, several variables have been considered important while investigating attitudes toward PE such as "… prior experience, either successful or unsuccessful; feedback received from outside sources; societal expectations for appropriateness of engagement; perceptions of usefulness of material; and feedback received from peers and teacher" (Scrabis-Fletcher & Silverman, 2017, p. 86).

Therefore, researchers have raised concerns about how to sustain positive attitudes toward PE across youth's participation in school and develop a context conducive to long-lasting sport participation and positive health (Woodson-Smith et al., 2015).

It has been consensual that:

> …with the knowledge we currently possess, it seems reasonable to predict that, in cultures with democratic values, where giving opportunities to all students is a primary educational value, the mastery motivational climate will favor not

only the intrinsic motivation and the intention of the students to carry out physical activity and sport, but also the personal and social development of the pupils" (Escartí & Gutiérrez, 2001, p. 8).

Hence, research on motivational climate and attitudes toward PE have considered the need to acknowledge the role played by context and variables such as teacher education, policy, students' competence and the social forces present in diverse socio-cultural settings (Moyano, Pacheco, & Urbieta, 2018; Baños & Arrayale, 2020). Nevertheless, studies that have analyzed "…the relative influence of significant others changes according to the developmental status of individuals and contexts» (Weigand, Sam Carr, Petherick, & Taylor, 2001, p.8) are still scarce in some sociocultural contexts such as Portugal.

The socio-cultural context and related variables are crucial to explain the motivational climate and attitudes toward PE (Quennerstedt, & Larsson, 2015). In other words, "cultural, institutional and historical contexts of PE can create different conditions for teaching and learning" (Quennerstedt & Larsson, 2015, p.569). For example, in Portugal, there are diverse contextualized variables that directly impact PE. For example, PE in primary schools may be delivered by a PE or generalist teacher (Neves, 2019).

Throughout teacher education programs, generalist teachers are exposed to few courses specifically focused on PE. Thus, generalist teachers might have, in some cases, limited ability to create an intrinsically motivated climate and generate positive attitudes towards PE (Neves, 2001). Previous studies (Santos, Farias, Hilvoorde, Gould, & Pereira, 2020) have attempted to provide a nuanced understanding about the particularities of PE in primary schools. To disseminate a set of contextualized research and practical implications, it is necessary to understand the need to consider motivational climate and attitudes towards PE as outcomes of a given education system and a range of context variables. This approach may help improve the quality of PE and impact research and practice, and potentially change the current *status quo* whereas PE is, in some cases, considered a less important discipline (Neves, 2001).

In sum, previous studies have provided great insight on how motivational climate may be structured by PE teachers to increase student participation, engagement and competence that ultimately leads to positive attitudes toward PE and the intention to engage in physical education and sport (Côté & Fraser-Thomas, 2007; Fraser-Thomas, Côté, & Deakin, 2008). Nevertheless, certain variables such as student perceived

competence have been investigated separately which may limit our understanding about the role played by context, specifically in socio-cultural contexts whereas research and practice are still distant (Braithwaitea et al., 2011; Quennerstedt & Larsson, 2015). In order to effectively create and disseminate knowledge, a broader focus on contextual variables is needed which might help develop policies and evidence-based guidelines that reflect contextual intricacies across a range of socio-cultural contexts (Guwatudde et al., 2016).

Implications for Research and Practice

Several educational reforms across the world (Ministry of Education, 2007; Silva, Marques, Mata, & Rosa, 2016; Statistics Canada, 2014) have been conducted to increase sport participation among students and generate better outcomes such as positive attitudes toward PE, higher perceived competence and a fun/enjoyable climate. Thus, research on motivational climate and attitudes toward PE has the power to help shed light on real-world problems with tremendous impact across a range of socio-cultural contexts (Sevil, García-González, Abós, Generelo, & Aibar, 2019). However, many schools are still "…fearful of receiving negative publicity when participating in research" (Quennerstedt & Larsson, 2015, p.568) and researchers still struggle to influence practice and develop practice-based evidence. In this sense, it could be necessary to consider integrating theory and contextual variables through appropriate research designs. Appropriate research designs may (a) be defined through discussions with stakeholders such as PE teachers and school administrators, (b) acknowledge the influence of context variables and identify the most relevant ones to investigate motivational climate and attitudes towards PE, and (c) focus on knowledge translation. First, context variables may help explain the relationship between teachers' instructional efforts within a specific socio-cultural context and students' outcomes. An analysis focused on how and why teachers foster a specific motivational climate and attitudes towards PE is needed. For example, in the Portuguese context, throughout the last decades some researchers have criticised teacher education programs and the lack of value given to PE (Neves, 2001) as this line of inquiry has been considered crucial (Sá & Costa, 2009). However, there is still the need to further understand the connection between teacher education programs, motivational climate and students' attitudes towards PE. A thorough assessment of the current teacher education program that considers the motivational climate and students' attitudes as desired outcomes is

needed. Such as approach could facilitate knowledge translation and the bridge the potential gap between research and practice.

If an appropriate motivational climate that leads to positive attitudes toward PE is to be created on a larger scale, future studies may need to provide a more diverse and integrative outlook. Such integrative outlook could be facilitated by policy makers through a national research program whereas research priorities per school and/or district are defined and consider context variables deemed crucial for actual change in PE. This national research program could serve as a guide for researchers to focus on the most relevant context variables that need to be investigated. Evidence-informed decisions and a concern towards practice-based evidence may be key to improve students' experiences in PE since early childhood until adolescence. This is a necessary step within the Portuguese context, and possibly among other contexts, to create impactful research that reaches PE teachers, school administrators, parents and ultimately students.

Further, an integrative outlook may highlight how variables such as policy, curriculum, teachers' instructional efforts, student outcomes and teacher education influence motivational climate and attitudes toward PE. Neves (2001), reflecting on the Portuguese context, raised awareness about how research has not reached stakeholders who still have a narrow perspective on PE. The extent to which researchers and practitioners are open to develop research-to-practice partnerships and contextualized knowledge may be influenced by a set of social forces such as the way PE and research are valued, how the teaching profession is portrayed by society, professional development opportunities, the priorities set by policy makers, the need to publish, among other factors (Quennerstedt & Larsson, 2015).

Therefore, we invite researchers to (a) develop collaborate efforts to understand what quality PE means across age groups/grade levels, (b) help increase practitioners' openness to research and (c) use research designs that include context variables to understand why there is a specific motivational climate and a set of attitudes toward PE and what needs to be considered moving forward. Considering these notions, an outcome evaluation of teacher education programs through motivational climate and students' attitudes toward PE may be necessary to inform future education reforms and research priorities. A process evaluation of teacher education programs could also help understand why there is a specific motivational climate and a set of attitudes toward PE. This process evaluation may include an analysis of the number of hours focused on specific grade levels and types of learning experiences. Research on how practitioners

use evidence is also needed to assess knowledge translation. Taking into consideration the intricacies of the Portuguese context, we aim to prompt reflection about PE through the case of Portugal and highlight what do we know about motivational climate and attitudes toward PE and current challenges.

Conclusions

The purpose of this section is to analyze the existence of potential gaps between kinesiology research and practice and suggest guidelines for future research and practice on motivational climate and attitudes towards PE. The experiences and reflections on the Portuguese context were used to prompt reflection about this topic. Previous research has provided great insight on motivational climate and attitudes towards PE. However, there are still concerns about the disconnect between research and practice in some contexts.

In this sense, we urge researchers to develop a reflection about how investigations could better reflect concrete practical issues and «get at» the nature of providing an appropriate motivational climate that generates positive attitudes towards PE. To do so, looking beyond students' attitudes towards PE and the motivational climate experienced in PE may be necessary. To help bridge the gap between research and practice, other variables such as teacher education, curriculum and social pressures may need to be considered.

Chapter 3. Empirical Studies

Study 2

Examining Portuguese high school students' attitudes toward physical education

Abstract

Portugal ranks fourth among countries with the highest rate of overweight population, considering that 67.6% of the Portuguese population over the age of 15 is overweight or obese. To our knowledge, limited studies have investigated students' attitudes toward physical education in Portugal. Such research is necessary because it can provide valuable insights for policy and application in the curriculum development for physical education, which may eventually increase participation in physical and sports activities. This study analyzed students' attitudes toward physical education (PE) according to sociodemographic variables, including grade level, socioeconomic status, and gender, and their participation in extracurricular sports activities and respective PE grades. The sample comprised 476 high school students (from the 7th, 8th, and 9th-grade levels) from five public schools located in Portugal. The Students' Attitudes toward Physical Education Questionnaire was adapted and validated for use with Portuguese students as a two-factor model. Findings show that students generally have a moderately positive attitude toward PE. However, students' positive attitudes tend to decrease throughout high school, which is particularly significant in the 9th grade. Furthermore, students' attitudes are influenced by gender, extracurricular sports practice, and

grades. These findings may help stakeholders reflect on how to frame PE in a more meaningful way to create a solid foundation for maintaining an active lifestyle throughout life. Implications for further research and practice are discussed.

Keywords:

School; pedagogy; curriculum; extracurricular sports; physical activity.

Introduction

Previous research has shown an increase in sedentary behavior among young people over the last 20 years (Li et al., 2014), which has contributed to the rise in global obesity rates. The Organization for Economic Cooperation and Development (OECD, 2019) has reported that obesity has been gradually increasing since the early 2000s among adults; specifically, 67.6% of the Portuguese population over the age of 15 is considered overweight or obese. Portugal, together with Finland, ranked fourth in the OECD countries with the highest rates of overweight population, preceded by Chile (74.2%), Mexico (72.5%), and the United States (71%) who are in the top three.

The decrease in participation of young people in physical activities and sports, which has a significant impact on the overall health (Guthold et al., 2020), stresses the need to identify the factors that contribute to increasing the level of participation. Therefore, compulsory physical education (PE) in Portugal may be essential. A primary goal of PE is to encourage young people to adopt active lifestyles by teaching them to engage in persistent and meaningful lifelong participation in physical activities and sports (Marttinen et al., 2018). This means that PE should provide youth with substantial physical activity in the school environment since it is particularly important for those who engage in low levels of daily physical activity (Hu et al., 2014). Additionally, PE also creates firm foundations for participation in sports activities outside school (McKenzie, 2003; Wallhead & Buckworth, 2004; Constantinides and Silverman, 2018). However, considering this objective, we might find PE classes to be insufficient to meet the recommendations of the World Health Organization (2010) and the American College of Sports Medicine (2018) to promote substantial autonomous extracurricular sports activities (Sierra-Díaz et al., 2019). For instance, in Portugal, students from 5th to 12th year (i.e., students aged above 11 years) have 150 min per week of compulsory PE, which does not meet the standards set by the World Health Organization (2010).

Previous studies have highlighted the influence of some variables on students' subsequent participation in physical activities and sports outside the school context (Subramaniam & Silverman, 2000; Jaakkola et al., 2017). One of these variables is attitudes (Mercier et al., 2017). Eagly and Chaiken (1993, p. 1), in their seminal work, state that attitudes can be understood as a hypothetical construct referring to the "psychological trend that is expressed in a favorable or unfavorable assessment of a specific entity". A long-term goal of PE programs worldwide is to develop positive

attitudes toward PE (Donovan et al., 2015). Thus, several studies have shown that the development of positive attitudes toward PE can help young people engage in physical activities outside school and promote active lifestyles during their school years (Hagger et al., 2003; Phillips and Silverman, 2015; Solmon, 2015) and adulthood (Telama et al., 2005; Subramaniam and Silverman, 2007).

Several models facilitate our understanding of how students' attitudes influence behavior, such as the theory of reflected action/theory of reasoned action (TRA; Fishbein and Ajzen, 1975), the theory of planned action/theory of planned behavior (TPB; Ajzen, 1985), and the reasoned action model (RAM; Fishbein and Ajzen, 2010). Most studies on students' attitudes toward PE developed in the 21st century were guided by TRA (Silverman, 2017), which supports the notion that all behavior is a choice among several alternatives, and therefore, behavioral intention (i.e., predisposition toward a behavior) is the best predictor of behavior. Behavioral intention is determined by two important factors: an individual's attitude toward the behavior (i.e., personal influence on behavior) and subjective norms (i.e., social pressures that affect behavior).

In recent decades, the number of studies that focus on students' attitudes toward PE (Silverman and Subramaniam, 1999; Subramaniam and Silverman, 2000; Chung and Phillips, 2002; Koca and Demirhan, 2004; Li et al., 2014) has increased after the review article published by Silverman and Subramaniam (1999) suggested the need to further develop the field and strive for quality PE. Additionally, they revealed that most previous studies used non-validated instruments, qualitative methodologies, and were conceptually fragile (Silverman and Subramaniam, 1999). Recently, Silverman (2017) reinforced the need to develop theory-based research that involved more rigorous designs. As such, the construction and validation of the Students' Attitudes toward Physical Education Questionnaire (SAtPE; Subramaniam and Silverman, 2000) motivated many studies on students' attitudes toward PE.

The SAtPE (Subramaniam and Silverman, 2000) was designed to assess students' attitudes toward PE, and has favorable psychometric properties of validity and fidelity (Subramaniam and Silverman, 2000; Montalvo and Silverman, 2008; Donovan et al., 2015; Constantinides and Silverman, 2018). Over the past 20 years, most studies that have used SAtPE have found that students have moderate to high positive attitudes toward PE. However, it should be noted that most of these studies were conducted in the United States (Subramaniam and Silverman, 2000, 2007; Montalvo and Silverman, 2008; Zeng et al., 2011; Donovan et al., 2015; Phillips and Silverman, 2015; Scrabis-

Fletcher et al., 2016; Mercier et al., 2017; Scrabis-Fletcher and Silverman, 2017; Marttinen et al., 2018), while only a few have been conducted in European (Lazarevi´c et al., 2015; Constantinides and Silverman, 2018; Evangelou and Digelidis, 2018; Orlić et al., 2018) and Asian countries (Koca and Demirhan, 2004; Hu et al., 2014). Moreover, research in non-English speaking countries, which include diverse education systems, is still scarce. Considering the increase in the number of obese individuals and those who do not have an active lifestyle across European countries (OECD, 2019), more insight about students' attitudes toward PE is necessary to provide important implications for policy, research, and practice.

According to the literature, several variables determine students' attitudes toward PE, such as grade level, gender, and family's socioeconomic status. Regarding the educational level, most studies suggest that students' positive attitudes toward PE decrease after high school (Subramaniam and Silverman, 2000, 2007; Hu et al., 2014; Lazarevi´c et al., 2015; Scrabis-Fletcher et al., 2016; Mercier et al., 2017; Evangelou and Digelidis, 2018; Marttinen et al., 2018). Concerning gender, most studies did not show statistically significant differences between males and females (Subramaniam and Silverman, 2000, 2007; Hu et al., 2014; Scrabis-Fletcher et al., 2016; Marttinen et al., 2018; Orlić et al., 2018), while others have reported that male students have more positive attitudes than female students (Lazarevic et al., 2015; Mercier et al., 2017). Finally, a study conducted at a North American high school (Zeng et al., 2011) found no significant differences in attitudes toward PE based on students' socioeconomic status. Nevertheless, research on the impact of socioeconomic status on students' attitudes toward PE is still scarce.

Recently, interest in the association between students' attitudes toward PE and their participation in extracurricular physical activities has been increasing. The development of positive attitudes toward PE has been considered a determinant for young people to remain active outside the school environment (Hagger et al., 2003; Solmon, 2003; Phillips and Silverman, 2015), in high school (Lazarevic et al., 2015; Orlić et al., 2018), or secondary school (Koca and Demirhan, 2004).

Attitudes toward PE are also influenced by contextual factors (Phillips and Silverman, 2015), such as teachers and the curriculum (Subramaniam and Silverman, 2000; Silverman, 2011; Mercier et al., 2017). Silverman (2011) seminal work highlighted curriculum as the most influential factor in developing students' attitudes toward PE. Additionally, Luke and Sinclair (1991) alluded to the fact that teachers' behaviors constitute the second most decisive factor in students' negative attitudes toward PE.

The present study was conducted in Portugal. Similar to other European countries, compulsory education in Portugal last for 12 years. PE is part of the curriculum in the first 4 years (first to fourth-grade levels; children aged between 6 and 10 years). However, in some cases, it is disregarded by generalist teachers, and engaging in various extracurricular physical activities and sports is not compulsory. Conversely, PE is a compulsory class for 5th to 12th grade. Students' grades in PE are also considered in their weighted average and application to universities.

To our knowledge, studies that investigate students' attitudes toward PE in the Portuguese context are scarce, and there is a lack of validated instruments that focus on this field. Therefore, this study proposed to (a) validate the SAtPE (Subramaniam & Silverman, 2000) for use in the Portuguese population, (b) analyze Portuguese high school students' attitudes toward PE, and (c) examine the influence of sociodemographic variables (i.e., educational and socioeconomic level and gender), extracurricular sports participation, and school performance in PE (i.e., grade attained) on students' attitudes toward PE. The following hypothesis guided the present study: (1) high school students' have a moderately positive attitude toward PE; (2) high school students' attitudes decrease throughout grades in PE; (3) male high school students have more positive attitudes toward PE than their female counterparts; (4) high school students with higher socioeconomic status have more positive attitudes toward PE than students with lower socioeconomic status; (5) high school students who engage in extracurricular sports activities have higher positive attitudes toward PE than those who do not; (6) high school students with higher grades have more positive attitudes toward PE.

Materials and Methods

Study Design

Based on Ato et al.'s (2013) classification system for research designs in psychology, our study design represents empirical research purposes and involved a retrospective design or ex post facto. Thus, we examined causal relationships between independent and dependent variables. A correlational design was used since the independent and

dependent variables were not manipulated. Furthermore, sampling was not determined based on these variables (Tuckman, 2002).

Study Phases

The present study involved two phases. In the first phase, we validated the SAtPE by conducting several analytical steps, as suggested by previous research (Subramaniam and Silverman, 2000). This process involved the translation of the instrument, the use of confirmatory factor analysis, and an assessment of the questionnaire's fidelity. In the second phase, after the validation process, the questionnaire was administered to a large sample of high school students.

Sample

A non-probabilistic sampling method was utilized to recruit participants. A convenience sample of 476 students was included in the present study. The participants were students from the 7th, 8th, and 9th grades who were recruited from five urban high schools in five districts in northern and central Portugal. Of the sample, 52.3% (n=249) were male and 47.7% (n=227) were female. The students' ages ranged between 12 and 17 years (M=13.38; SD=0.95). Regarding the socioeconomic status, 47.7, 38.4, and 13.9% came from middle, low, and high-class families, respectively. Socioeconomic status was determined according to the criteria proposed by Simões (2000) for the Portuguese population. Moreover, 65.5 and 58.1% of male and female students, respectively, were involved in extracurricular physical activities and sports. Furthermore, 38.7, 49.8, and 9.2% had a final grade of 3, 4, and 5, respectively. Only 2.3% failed in PE and had a final grade of 2.

Procedure

Before conducting the present study, ethical approval was attained from the Ministry of Education (Office of Statistics and Education Planning), and school directors were presented with the study objectives, scope, and implications. PE teachers, parents, tutors, and students were briefed about the study, and informed consent was obtained.

Data was collected between March 2019 and June 2019. The SAtPE was administered during the beginning or the end of a PE class, with at least one researcher present to provide any clarifications as needed. The questionnaire included information about the purpose of the study and instructions for the participants. Participants were informed that they were not being evaluated (scored) to avoid the effects of social desirability. Additionally, they were notified about the confidentiality of the questionnaire data, and that PE teachers would not have access to the results.

The SAtPE Questionnaire

It comprises 20 items, 8 of which are negatively worded. Responses are provided using a five-point Likert scale ranging from 1 (totally disagree) to 5 (totally agree), with scores ranging from 20 to 100, with higher scores indicating more positive attitudes toward PE. Based on the previous notions, attitudes are based on two key components (cognitive or perceived utility and affective or enjoyment) (Subramaniam & Silverman, 2007), which contain two sub-factors each (teacher and curriculum). The SAtPE involves 10 items associated with cognitive or perceived utility (items 4, 6, 7, 8, 10, 13, 14, 16, 17, and 18) and 10 items associated with the affective or enjoyment component (items 1, 2, 3, 5, 9, 11, 12, 15, and 19).

Translation

Permission was granted from the authors who constructed the original questionnaire to validate it in the Portuguese context. A back-translation method was used to ensure the appropriateness of the translation. It is the most widely used method in social sciences to assess the appropriateness and clarity of language (Douglas & Craig, 2007). We requested two university professors who were fluent in English language to translate the questionnaire into Portuguese. These two translations were subsequently compared with no major differences between them. We then asked another university professor to translate the final Portuguese version into English. The original version of the instrument was compared with the back-translated version with no major differences; hence, the questionnaire was considered suitable. Subsequently, a pilot study was conducted with a group of 30 students to test the clarity of language and appropriateness of the items.

This subsample of students was not included in the main study. The average of the students was 13.53 years (*SD*=1.13) with 47.7% males and 53.3% females. No issues were raised regarding the items' appropriateness and clarity of language.

Data Analysis

In the first phase of the study, we examined SAtPE's psychometric properties using the Analysis of Moment Structures software (AMOS; version 24). First, univariate and multivariate normality were determined by the asymmetry coefficients (Sk; |Sk| < 3), kurtosis (Ku; |Ku| < 10), and Mardia's (1970) coefficient. Asymmetry values higher than 3 and kurtosis values higher than 10 need transformation (Kline, 2016). Furthermore, Mardia's coefficient is considered appropriate when the value is lower than p, which represents the number of observed variables (Bollen, 1989). Second, a confirmatory factorial analysis (CFA) was conducted using the maximum likelihood estimation method. This procedure assessed whether the SAtPE followed the factorial structure proposed in the original version (Subramaniam and Silverman, 2000). Third, model adequacy was tested using absolute and relative fit indexes recommended in previous literature (Hu and Bentler, 1999; Jackson et al., 2009; Byrne, 2010; Marôco, 2014).

Absolute fit indexes included Chi-square (x^2), Chi-square and degrees of freedom ratio (χ^2/df), and the goodness of fit index (GFI). Conversely, the relative fit indexes were the comparative fit index (CFI), normed fit index (NFI), and Tucker-Lewis index (TLI). The following incremental indexes were also utilized: root mean square error of approximation (RMSEA) and root mean square residual (RMSR). Previous studies have suggested that there is appropriate model adequacy when $\chi^2/df < 2$; GFI ≥ 0.95; CFI ≥ 0.95; NFI ≥ 0.95 e TLI ≥ 0.95; RMSEA < 0.06; RMSR < 0.08. However, these values have been considered acceptable: $\chi^2/df < 5$, GFI > 0.90, CFI > 0.90, NFI > 0.90, TLI > 0.90, RMSEA < 0.10, RMSR < 0.10 (Hu and Bentler, 1999; Byrne, 2010; Kline, 2016). Fourth, individual reliability ($\lambda 2$) and composite reliability (CR) were tested to verify construct reliability. On the other hand, concurrent reliability was tested through the average variance extracted (AVE) of each factor with a cut-off point of 0.50 (Hair et al., 2018). Finally, the discriminant validity of each factor was assessed through a comparison between the AVE and average shared squared variance. We assessed the temporal stability of SAtPE through a test-retest procedure. Thus, this procedure involved 46 students who filled the questionnaire on two occasions with a 2-week

interval. Results were analyzed using Pearson's correlation coefficient. According to Keszei et al. (2010), a 10–14 days interval between the test and retest is deemed appropriate. Furthermore, they also consider 0.70 and 0.80 as acceptable reliability coefficients.

In the second phase of the study, data were subjected to several procedures using the Statistics Package for Social Sciences (SPSS; version 24). Negatively formulated items were quoted inversely. The students' individual scores were analyzed according to the whole questionnaire as well as for each of the two notable components (perceived utility and enjoyment). A descriptive analysis (i.e., average and standard deviation) of the scores attained by the different groups of students was performed. Several MANOVAs were conducted to determine the differences in scores for the whole instrument depending on the grade level (i.e., 7th, 8th, and 9th grade), gender (male vs. female), socioeconomic status (i.e., upper, middle, and lower), and extracurricular sports practice (practice vs. no practice). MANOVA was used to analyze the differences in students' global attitudes toward PE (dependent variable) based on their grade level (7th, 8th, and 9th grade), gender (female vs. male), socioeconomic status (upper, middle, and lower), and extracurricular sports practice (practice vs. no practice), which were treated as independent variables. If the MANOVA were statistically significant, discriminant analysis was conducted, specifically ANOVA, to determine differences between groups (Stevens, 2002). ANOVA was used to examine the influence of students' grades on their attitudes toward PE.

Results

Validation

In the validation stage of the SAtPE, a subsample of 399 students was included (51.6% males and 48.4% females; mean age = 13.37; SD = 0.93). The variables presented univariate normality as the Sk and Ku values were lower than |1.15| e |1.23|, respectively (Table 1). Thus, there were no significant normality violations. According to Marôco (2014), |Sk| < 3 and |Ku| < 10 are considered acceptable.

Concerning multivariate normality, Mardia's coefficient was 39.53, which is lower than p (p + 2). The two-factor model tested through CFA presented acceptable fit indices [x^2 (342) = 1146.2; p < 0.001; χ^2/df = 3.3; GFI = 0.88; CFI = 0.91; NFI = 0.89; TLI = 0.89; RMSEA = 0.07; RMSR D 0.09]. To increase model adequacy, trajectories between the residuals of items 12 and 15 (i.e., factor enjoyment) as well as 14 and 18 (i.e., factor perceived utility) were included. Thus, the model adequacy was slightly higher than the original model (GFI = 0.86; AGFI = 0.82; RMSEA = 0.08; RMSR = 0.09). Therefore, we did not remove any item.

Table 1 shows data from standardized factorial weights, individual reliability ($\lambda 2$), CR, and AVE. Most items have factorial weights higher than 0.50, which is considered acceptable (Hair et al., 2018). Only items 2 ("The games I learn in my physical education class make learning unpleasant for me") and 14 ("The games I learn in my physical education class seem unimportant to me") presented lower values of 0.49 and 0.48, respectively.

The two dimensions of "perceived utility" and "enjoyment" had high CR. Further, the AVE values were above the cutoff point of 0.5, which suggests good concurrent validity. Concerning the concurrent validity, the correlation between the square factors (0.522 = 0.027) was significantly lower than the AVE values for each factor. Thus, these factors are distinct.

The test-retest correlation was r = 0.869 for the entire questionnaire. Specifically, the coefficients for the perceived utility and enjoyment components were r = 0.828 and r = 0.826, respectively. These results showed that SAtPE had acceptable temporal stability.

Table 1. SAtPE's descriptives per item

Factor	Item	Average	SD	*Sk*	*Ku*	λ	λ2	CR	AVE
Perceived	4	3.96	1.32	−1.02	−0.28	0.53	0.28	0.81	0.54
utility	6	4.01	1.26	−1.14	0.18	0.56	0.32		
	7	4.03	0.99	−0.92	0.36	0.73	0.54		
	8	4.11	0.89	−0.43	0.73	0.80	0.64		
	10	3.70	1.31	−77	−0.47	0.57	0.32		
	13	3.88	1.05	−0.67	−0.05	0.70	0.49		
	14	3.43	1.39	−0.31	−1.22	0.48	0.23		
	16	3.75	1.30	−0.79	−0.46	0.55	0.30		
	17	4.10	0.95	−0.89	0.45	0.76	0.58		
	18	3.97	1.25	−1.01	−0.08	0.54	0.29		
Enjoyment	1	4.17	0.85	−0.65	−0.51	0.75	0.56	0.86	0.51
	2	3.96	1.22	−0.92	−0.23	0.49	0.24		
	3	4.09	0.93	−0.80	−0.02	0.73	0.54		
	5	3.99	1.23	−1.08	−0.15	0.57	0.33		
	9	4.09	0.91	−0.85	0.44	0.74	0.54		
	11	4.06	0.94	−0.68	−0.30	0.74	0.55		
	12	3.96	1.18	−0.93	−0.13	0.56	0.31		
	15	3.97	1.26	−0.96	−0.26	0.52	0.27		
	19	4.06	0.93	−0.89	0.64	0.75	0.57		
	20	4.14	0.87	−0.68	−0.15	0.77	0.59		

Descriptive analysis

Students reported positive attitudes toward PE. The average score of most high school students concerning their attitudes toward PE was 79.86 (SD = 14.91). Male students obtained an average SAtPE score of 79.04 (SD = 15.63), while female students had an average score of 80.75 (SD = 14.04). Furthermore, the average scores obtained by students in the 7th, 8th, and 9th grades were 81.20 (SD = 13.81), 80.32 (SD = 13.57), and 76.54 (SD = 16.95), respectively (Table 2).

Table 2. Scores in the SAtPE according to the grade level and gender

Factor	7th grade (*n* = 151; 31.7%)			8th grade (*n* = 232; 48.7%)			9th grade (*n* = 93; 19.5%)			Total (*n* = 476; 100%)		
	Male	Female	Male + Female	Male	Female	Male + Female	Male	Female	Male + Female	Male	Female	Male + Female
Enjoyment	41.89	41.46	41.70	39.29	42.10	40.66	38.84	39.70	39.25	40.06	41.43	40.71
Perceived usefulness	40.48	38.38	39.50	38.62	40.77	39.66	37.39	37.18	37.29	38.99	39.33	39.15
Total	82.37	79.81	81.20	77.91	82.87	80.32	76.22	76.89	76.54	79.04	80.75	79.86

Regarding socioeconomic status, low, middle, and high-class students had average scores of 78.05 (SD = 17.20), 81.03 (SD = 13.40), and 80.85 (SD = 12.51; Table 3), respectively.

Table 3. Scores in the SAtPE according to socioeconomic status

Factor	Low (N= 183; 38.4%)	Middle (N= 227; 47.7%)	High (N= 66; 13.9%)
Enjoyment	39.72 (8.53)	41.36 (7.15)	41.23 (6.27)
Perceived usefulness	38.33 (9.05)	39.67 (6.93)	39.62 (6.76)
Total	78.05 (17.19)	81.03 (13.40)	80.85 (12.51)

Of the sample, 62% participated in extracurricular sports activities. Regarding the grade level, 64.9, 67.2, and 44.1% of students from the 7th, 8th, and 9th grades, respectively, were involved in extracurricular sports activities. Furthermore, 65.5% of boys and 58.1% of girls practiced extracurricular sports activities. Concerning students' participation in sports activities based on their socioeconomic status, findings showed that 60.6% of high class, 70.5% of middle class, and 51.9% of low-class students were involved in such activities. Students who practiced extracurricular sports activities had an average score of 82.75 (SD = 13.59) in the SAtPE, while those who did not practice averaged at 75.14 (SD = 15.76; Table 4).

Table 4. Scores in the SAtPE according to practice vs. non-practice of extracurricular sport activities

Factor	Do sports (N= 295; 62%)	Do not play sports (N= 181; 38%)
Enjoyment	42.11 (7.02)	38.44 (7.90)
Perceived usefulness	40.65 (7.25)	36.71(8.40)
Total	82.75 (13.59)	75.14 (15.76)

Regarding grades in PE (in Portuguese school settings, grades range from 1 to 5), students who attained a grade of 3 had an average score of 76.32 (SD = 14.14) in the SAtPE. Conversely, those who obtained a grade of 4 had an average of 81.91 (SD = 15.26), while those who attained 5 had an average of 84.50 (SD = 13.38; Table 5).

Table 5. Scores in the SAtPE according to grades in PE

Factor	Grade in PE - 3 (N= 184; 38.7%)	Grade in PE - 4 (N= 237; 49.8%)	Grade in PE - 5 (N= 44; 9.2%)
Enjoyment	38.60 (7.32)	42.04 (7.64)	42.93 (7.17)
Perceived usefulness	37.72 (7.38)	39.87 (8.10)	41.57 (6.69)
Total	76.32 (14.14)	81.91 (15.26)	84.50 (13.38)

Inferential Analysis

Generally, the groups of students mentioned above obtained higher scores in the enjoyment factor than in the perceived usefulness factor. Thus, Table 6 shows the results of MANOVA for students' attitudes toward PE, considering the main effects of each of the four independent variables and their interaction effects.

Multivariate analysis showed statistically significant univariate effects of grade level [Wilk's lambda = 0.973, $F_{(4,\ 880)} = 3.066$, $p < 0.05$, $\eta_p^2 = 0.014$], gender [Wilk's Lambda = 0.986, $F_{(2,\ 440)} = 3.172$, $p < 0.05$, $\eta_p^2 = 0.014$], and extracurricular sports activities [Wilk's Lambda = 0.967, $F_{(2,\ 440)} = 7.559$, $p < 0.01$, $\eta_p^2 = 0.033$] on students' global attitude toward PE. In contrast, students' socioeconomic status did not influence their attitudes toward PE. There were no significant interaction effects

between the four independent variables (grade level, gender, socioeconomic status, and extracurricular sports participation).

Table 6. MANOVA for the students' global attitude toward PE

	MANOVA				
Variables	**Wilks' λ**	**F**	***gl***	**Sig.**	**η_p^2**
Grade level (GL)	0.973	3.066	4	0.016*	0.014
Gender	0.986	3.172	2	0.043*	0.014
Socioeconomic status (ST)	0.984	1.813	4	0.124	0.008
Sports practice (SP)	0.967	7.559	2	0.001**	0.033
GL X gender	0.992	0.833	4	0.504	0.004
GL X ST	0.967	1,878	8	0.060	0.017
GL X SP	0,994	0.688	4	0.600	0.003
Gender X ST	0.994	0.669	4	0.613	0.003
Gender X SP	0.999	0.166	2	0.847	0.001
ST X SP	0.998	0.259	4	0.904	0.001
GL X gender X ST	0.980	1.135	8	0.336	0.01
GL X gender X SP	0.991	1.032	4	0.390	0,005
GL X ST X SP	0.973	1.539	8	0.140	0.014
Gender X ST X SP	0.983	1.898	4	0.109	0.009
GL X gender X ST X SP	0.983	1.286	6	0.261	0.009

* $p < 0.05$ ** $p < 0.01$

Concerning the grade level, discriminant analysis showed differences only in the perceived utility factor of attitudes [$F_{(2)} = 3.055$, $p < 0.05$, $\eta_p^2 = 0.013$]. ANOVA indicated that students from the eighth-grade had significantly higher scores on enjoyment and perceived utility factors than their ninth-grade counterparts. Concerning gender, univariate analysis highlighted statistically significant differences between male and female students regarding the affective factor of attitudes toward PE [$F_{(1)} = 3.863$, $p \leq 0.05$, $\eta_p^2 = 0.08$], with the latter obtaining higher values. Regarding extracurricular sports practice, univariate analysis showed that statistically significant differences were associated with enjoyment [$F_{(1)} = 27.412$, $p < 0.01$, $\eta_p^2 = 0.055$] and perceived utility [$F_{(1)} = 30.36$, $p < 0.01$, $\eta_p^2 = 0.060$] factors of the SAtPE.

Finally, we examined the relationship between students' school grades and their attitudes toward PE. Through ANOVA, the data obtained showed statistically significant differences in attitudes toward PE [$F_{(3)} = 6.673$, $p < 0.01$, $\eta_p^2 = 0.041$] and in its two factors, enjoyment [$F_{(3)} = 8.924$, $p < 0.01$, $\eta_p^2 = 0.054$] and perceived utility [$F_{(3)} = 4.234$, $p < 0.01$, $\eta_p^2 = 0.026$], depending on the students' grades. Scheffe's *post hoc* test showed that these differences were evident between students who had grades of 4 and 5 in PE.

Discussion

This study examined Portuguese high school students' attitudes toward PE. The SAtPE was validated to achieve this objective. Our findings showed that the instrument presented acceptable psychometric properties concerning validity and reliability and may be used to assess Portuguese high school students' attitudes toward PE, which provides new opportunities for researchers to explore this line of inquiry. However, it is essential to continue testing the instrument either by using different samples or examining whether the four-factor structure imparts a more appropriate adjustment.

Our findings showed that students generally had a moderately positive attitude toward PE, which confirms hypothesis (1). Specifically, our study suggests that students enjoy PE classes and consider it an important discipline. Thus, Portuguese students' scores in the SAtPE were slightly higher than those reported in previous studies conducted in the United States (Subramaniam and Silverman, 2007; Scrabis-Fletcher and Silverman, 2017; Marttinen et al., 2018), Europe (Lazarevic´ et al., 2015), and Asia (Hu et al., 2014), despite having a similar sample. Research has shown that positive attitudes toward PE are associated with the nature of this discipline. Moreover, several researchers have stated that PE is practical discipline wherein social interaction, fun, freedom, and movement-play are crucial, as opposed to other disciplines in the curriculum (Piéron, 2005).

The findings confirmed hypothesis (2), which was centered around the association between grade level and attitudes toward PE. Thus, we found that students' positive

attitudes toward PE decreased throughout high school, especially in the 9th grade. This decrease may derive from the cognitive component that is associated with the perceived usefulness of PE, which in turn largely depends on the curriculum and the PE teacher. Our results are corroborated by previous studies (Subramaniam & Silverman, 2000, 2007; Hu et al., 2014; Lazarevic et al., 2015; Scrabis-Fletcher et al., 2016; Mercier et al., 2017; Evangelou & Digelidis, 2018; Marttinen et al., 2018) that show that students' attitudes toward PE become less positive as they age. However, in these studies, this decline in positive attitudes toward PE is predominantly related to the affective component, which was not the case in our study.

It is of utmost importance for researchers, policymakers, and, particularly, PE teachers to understand the reasons for the decrease in positive attitudes toward PE. This is paramount because students' attitudes toward PE impact their participation in extracurricular activities and sports, and the creation of a foundation for active lifestyles (Solmon and Lee, 1996; Kohl & Hobbs, 1998; Hagger et al., 2003; McKenzie, 2003; Subramaniam & Silverman, 2007). One of the reasons for the decrease in positive attitudes toward PE is related to the fact that, in some cases, the curriculum lacks meaningful content that challenges students to increase their motor proficiency within an intrinsically motivated environment (Carlson, 1995; Subramaniam & Silverman, 2007). In Portugal, PE teachers are pressured to teach an extensive range of lessons (Santos et al., 2020) throughout grade levels, which may influence the way they use curriculum ownership and engage with students (Carlson, 1995; Subramaniam & Silverman, 2007). It is necessary to be informed regarding curricular reforms, consider students' attitudes toward PE, and use enjoyment and perceived utility as guiding variables for further development (Subramaniam & Silverman, 2000, 2002, 2007; Rikard and Banville, 2006; Montalvo & Silverman, 2008; Silverman, 2011; Phillips & Silverman, 2015; Mercier et al., 2017; Scrabis-Fletcher & Silverman, 2017; Subramaniam & Mercier, 2017; Marttinen et al., 2018; Orlić et al., 2018).

Curriculum ownership has been associated with an intrinsically motivated environment (Farias et al., 2020). Specifically, several factors have been considered crucial in fostering a positive climate in PE: (a) a task-oriented climate, (b) the integration of learner-centered models, such as the sports education model and a variety of teaching styles, and (c) the promotion of enjoyment, competency, and positive social relationships (Siedentop, 1994, 2004; Subramaniam and Silverman, 2002, 2007; Digelidis et al., 2003; Silverman, 2011; Mercier et al., 2017; Scrabis-Fletcher and Silverman, 2017; Constantinides & Silverman, 2018; Orlić et al., 2018).

Previous research has also indicated that as students get older, they consider the PE curriculum to be less useful (Constantinides & Silverman, 2018). In Portugal, students in the 9th grade must take exams in a range of disciplines. The pressure to perform and attain high scores in a vast array of disciplines may also influence how students experience PE, which may ultimately result in a lack of enjoyment. It is possible that as students get older, they undertake more demanding performance objectives and go through a set of social forces that value grades in other areas, which may result in reducing the importance of PE.

Hypotheses (3) and (4) were not confirmed. Our findings also showed that female students had more favorable attitudes toward PE than their male counterparts. However, these findings do not support previous studies conducted in the context of high school wherein male students reported having more positive attitudes toward PE (Lazarevic et al., 2015; Mercier et al., 2017), or with no statistically significant differences between genders (Subramaniam & Silverman, 2000, 2007; Hu et al., 2014; Scrabis-Fletcher et al., 2016; Marttinen et al., 2018; Orlić et al., 2018). In this study, female students reported significantly higher scores in the affective component, which suggests more enjoyment in PE.

Our findings might have been derived from the way the curriculum in Portugal is currently framed. The PE curriculum involves a range of physical and sports activities, such as dance and badminton. Previous research has shown that female students have more positive attitudes toward activities that value esthetic dimensions (e.g., dance, gymnastics), which are an important part of the PE curriculum, while male students present a more favorable attitude in activities that involve taking on challenges and risks, such as football (Greenwood & Stillwell, 2001; Zeng et al., 2011). Notably, the gender differences in attitudes toward PE may also be derived from cultural and societal value systems. From the perspective of several researchers (Tannehill et al., 1994; Piéron et al., 1997), students' attitudes toward PE are influenced by self-image, family, and social media, which create expectations for motor skill development and performance in various physical activities and sports.

As for the mediating role of students' socioeconomic status, our findings suggest that this variable did not influence attitudes toward PE, as indicated by previous research, which in turn did not confirm hypothesis (4) (Zeng et al., 2011). Our findings suggest that PE contributes to minimizing differences in attitudes among students from different socioeconomic statuses, which is an important variable for participation in extracurricular sports activities (Johnston et al., 2007).

Students who engaged in extracurricular sports activities had a more positive attitude toward PE than those who did not, as supported by previous research (Lazarevic et al., 2015; Peralta et al., 2015; Lima et al., 2018; Orlić et al., 2018). This finding confirmed hypothesis (5). Although we did not identify a cause effect relationship between the two variables, our findings suggest that students have more positive attitudes toward PE when they engage in extracurricular sports activities, which is aligned with the existing literature in this field (Phillips & Silverman, 2015). Furthermore, it was found that students' attitudes toward PE were influenced by their grades, as suggested by Li et al. (2014) and Orlić et al. (2018). This confirmed hypothesis (6). In other words, students with better grades had a more positive attitude toward PE. Grades have been acknowledged as a mediating variable of attitudes toward PE (Subramaniam & Silverman, 2007). It is noteworthy that there were no significant interaction effects in differentiating students' attitudes toward PE, which requires further exploration.

Conclusion

Positive attitudes toward PE may serve as motivation for PE teachers to achieve the final objective of PE — to foster participation in extracurricular sports and encourage engagement in physical activities throughout life. This study adds to the literature by shedding light on the attitudes of Portuguese high school students. However, this study has several limitations. First, a non-probabilistic sample was used in this study. Second, the sample was not representative of the Portuguese high school context, since only students from the north and center of the country were included. Finally, the model adequacy was only considered acceptable, which may suggest the need for further validation efforts.

As the field progresses, more descriptive and longitudinal studies must be conducted in European education systems to understand how students experience PE. Within this line of inquiry, it is essential to use validated tools and theory-based approaches to deductively characterize students' attitudes toward PE. Describing the variables that are responsible for the increase or decrease in attitudes toward PE could also

provide valuable insight for stakeholders and educational institutions. Further studies should also examine the effects of continuing professional development programs on students' attitudes toward PE, which have implications on how to train PE teachers. More Portuguese researchers should follow this line of study, which is paramount for generating sound and evidence-based policy and practice in the coming years.

Appendix

Item	Factor
1. The games I learn in physical education make my physical education class interesting for me. Os jogos que aprendo na aula de educação física fazem com que a aula de educação física seja interessante para mim. 2. The games I learn in my physical education class make learning unpleasant for me. Os jogos que aprendo na aula de educação física tornam a aprendizagem algo desagradável para mim. 3. The games I learn in my physical education class get me excited about physical education. Os jogos que aprendo na aula de educação física fazem com que fique entusiasmado em relação à educação física. 5. I feel the games I learn in physical education make my physical education class boring for me. Eu sinto que os jogos que aprendo na educação física fazem com que a aula de educação física seja aborrecida. 9. My physical education teacher makes my physical education class interesting for me. O meu professor de educação física faz com a aula de educação física seja interessante para mim. 11. I feel my physical education teacher makes learning in my physical education class fun for me. Eu sinto que o meu professor de educação física faz com que aprender na aula de educação física seja divertido para mim. 12. I feel my physical education teacher makes my physical education class boring for me. Eu sinto que o meu professor de educação física faz com que a aula de educação física seja aborrecida para mim. 15. My physical education teacher makes learning in my physical education class unpleasant for me. Eu sinto que o meu professor de educação física faz com que aprender na aula de educação física seja desagradável para mim. 19. My physical education teacher gets me excited about physical education. O meu professor de educação física faz com que fique entusiasmado com a educação física. 20. I feel the games I learn in my physical education class make learning fun for me. Eu sinto que os jogos que aprendo na aula de educação física fazem com que aprender seja divertido para mim.	*Factor 1: Enjoyment*
4. My physical education teacher makes my physical education class seem unimportant to me. O meu professor de educação física faz com que as aulas de educação física não sejam importantes para mim. 6. I feel the games I learn in my physical education class are useless to me. Eu sinto que os jogos que aprendo na aula de educação física são inúteis para mim. 7. The games I learn in my physical education class seem important to me. Eu sinto que os jogos que aprendo na aula de educação física são importantes para mim 8. My physical education teacher makes my physical education class seem important to me. O meu professor de educação física faz com que as aulas de educação física sejam importantes para mim. 10. The games I learn in my physical education class are useful to me. Eu sinto que os jogos que aprendo na aula de educação física são úteis para mim. 13. I feel the games I learn in my physical education class are valuable to me. Eu sinto que os jogos que aprendo na aula de educação física são essenciais para mim. 14. The games I learn in my physical education class seem unimportant to me. Eu sinto que os jogos que aprendo na aula de educação física não são importantes para mim. 16. My physical education teacher makes my physical education class useful for me. Eu sinto que o meu professor de educação física faz com que aprender na aula de educação física seja útil para mim. 17. I feel my physical education teacher makes learning in my physical education class valuable for me. Eu sinto que o meu professor de educação física faz com que aprender na aula de educação física seja essencial para mim. 18. I feel my physical education teacher makes learning in my physical education class useless for me. Eu sinto que o meu professor de educação física faz com que aprender na aula de educação física seja inútil para mim.	*Factor 2: Usefulness*

Study 3

Portuguese students' perceptions about the motivational climate in physical education

Abstract

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. 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. 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. 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.

Introduction

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 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 sociodemographic 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 (χ^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. It was 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: χ^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 (χ^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 D2 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 (χ^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.

Table 1. Standardized factorial weights, individual item reliability, composite reliability and average extracted variance from the EPCM dimensions

Factors	Item	λ	λ²	FC	AVE
Pupil's pursuit of progress	1	.72	.52	.86	.54
	6	.70	.48		
	11	.77	.59		
	15	.78	.61		
	19	.77	.59		
Teacher' s promotion of learning	3	.79	.62	.89	.63
	8	.77	.59		
	13	.87	.75		
	16	.87	.75		
Pupil´s pursuit of comparison	2	.67	.46	.77	.52
	7	.73	.53		
	12	.63	.39		
Teacher's promotion of comparison	4	.68	.47	.69	.38
	9	.63	.39		
	17	.62	.38		
Worrying about making mistakes	5	.66	.44	.72	.51
	10	.69	.47		
	14	.70	.49		
	18	.56	.31		

λ = Standardized factorial weight; λ² = individual item fidelity; FC = composite reliability; AVE = Average Variance Extracted

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, 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.

Table 2. Scores on the scales of mastery and performance climates according to level of education and gender

Climate	7th Grade (N = 151; 31.7%)			8th Grade (N = 232; 48.7%)			9th Grade (N = 93; 19.5%)			Total (N = 476; 100%)		
	Male	Female	Male+ Female	Male	Female	Male+ Female	Male	Female	Male+ Female	Male	Female	Male+ Female
Mastery	4.26	4.24	4.25	4.25	4.45	4.35	4.05	4.25	4.15	4.22	4.35	4.28
Performance	3.51	3.55	3.53	3.46	3.38	3.42	3.31	3.44	3.37	3.45	3.44	3.44

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.

Table 3. Scores on mastery and performance climatic scales according to socioeconomic level

Climate	Low SES (N = 183; 38.4%)	Medium SES (N = 227; 47.7%)	High SES (N= 66; 13.9%)
Mastery	4.17	4.34	4.28
Performance	3.42	3.46	3.47

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.

Table 4. MANOVA for the motivational climate of students in PE

	MANOVA				
Variables	**Wilks' λ**	**F**	***gl***	**Sig.**	**η_p^2**
Education Level	0.979	2.398	4	0.04*	0.01
Gender	0.994	1.438	2	0.238	0.06
Socioeconomic level	0.962	4.516	4	0.001**	0.019

* p < 0.05 ** p < 0.01

With regards 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 towards 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.

Table 5. Binary logistic regression analysis, which contains the independent variable associated with extracurricular sports participation

Variable	Odds ratio (OR)	95% CI	*p* value
Mastery climate	1.886	1.429-2.491	< .001*

* Significant value (p <.001) - Wald - Forward test; CI = Confidence interval

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 (β = 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 (β = 0.15, P = .097, adjusted R^2 = .020).

Table 6. Hierarchical multiple regression analysis with the variation of the students' classifications in PE according to their perceptions of the motivational climate

Variables	Standardized beta coefficient	R^2 change	Total R^2	F change (1, 473)	*p* value
Stage 1					
Mastery climate	.155	.022	.024	11.695	.001
Stage 2					
Mastery climate	.156	.020	.024	5.836	ns
Performance climate					

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.

In the present study, we also examined Portuguese high school students' perceptions of the motivational climate in PE. We found that students perceived their PE classes as being oriented toward mastery rather than performance. This finding aligns with those obtained in previous studies (Bakirtzoglou & Ioannou, 2011; Soini et al., 2014; Wang et al., 2010). PE research has shown that a mastery climate is more closely associated with adaptive motivational and affective patterns than a performance climate (Hastie et al., 2013; Tidmarsh et al., 2022; Treasure & Roberts, 2001).

Another purpose of the present study was to investigate whether sociodemographic variables (education level, gender, and SES) influenced students' perceptions of the motivational climate in PE. Regarding the level of education, the findings were somewhat unexpected; Grade 7 students considered PE classes more performance-oriented than Grade 9 students. In contrast, Sproule et al. (2007) found no significant

changes in students' perceptions of the motivational climate in PE over time, while other studies suggest that as students age, they tend to perceive a more performance-oriented climate (Baena-Extremera et al., 2015; Halvari et al., 2011).

The PE curriculum in Portugal must be followed by all teachers nationwide (Pereira et al., 2020) and reflects a progressive increase in content related to team sports throughout high school. This content may prompt PE teachers to emphasize competition, results, and game performance in their teaching approaches. In some cases, PE teachers might design and implement instruction mostly around team sports, which could 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 themotivational 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; Escriva-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.

Study 4

Validation of the sport motivation scale-II: implications for the Portuguese youth sport system

Abstract

Based on the tenets of self-determination theory, the Sport Motivation Scale-II is an 18 item instrument that consists of six subscales. Despite the numerous studies that have been conducted using self-determination theory in organized youth sport contexts, measures available to assess self-determined forms of motivation across socio-cultural contexts are scarce. This is particularly important because there are socio-cultural contexts that have diverse reward systems, competitive structures, and convey different social norms, values, and cultural nuances. The existence of measures available to assess self-determined forms of motivation across socio-cultural contexts may enable the development of a robust knowledge base that informs research-to-practice partnerships and potential changes across a complex youth sport landscape. The present study aimed to validate the factor structure of the Sport Motivation Scale-II with a sample of 239 Portuguese adolescent athletes. The participants' ages ranged between 12 and 17 years old (M = 14.39; SD = 1.35). Confirmatory factor analysis was conducted to achieve the aim of this study. Findings showed that the six-factor model used by the authors presents a good adjustment concerning sports participants' level of motivation toward sports practice. Moving forward, the Sport Motivation Scale-II may be used in future studies to help provide an understanding about athletes' self-determination. Several practical and theoretical implications are provided.

Keywords:

Amotivation; self-determination; confirmatory factor analysis; sport; youth.

Introduction

Consider an athlete who engaged in sport activities for a couple of months and tried to learn a range of sport skills. However, this athlete lacks the necessary self-determination to engage in these sport activities for a long period of time. This is the case for many athletes across the globe. Engagement in organized youth sport, physical education, and other forms of physical activity does not automatically lead to intrinsically motivated youth participants who appreciate and prioritize these types of activities (Bryan & Solmon, 2012). Further, organized youth sport does not always generate holistic youth development outcomes such as physical fitness, psychosocial skill development, or improved cognitive skills (Cairney et al., 2019; De Meester et al., 2017). To offer new conceptualizations about holistic youth development, there have been numerous campaigns emphasizing the importance of organized youth sport in fostering physical, but also mental health (Bull et al., 2020; Swann et al., 2018). Organized youth sport needs to be deliberately and carefully structured to induce positive outcomes (Bruner et al., 2021). Specifically, to have intrinsically motivated youth participants as well as foster prolonged engagement in sport activities and holistic youth development there is the need to reflect on the factors that contribute to these outcomes.

The strategies used by youth sport coaches and other meaningful adults, and their ability to create an adequate motivational climate are associated to motivation for sports practice and, subsequently, prolonged engagement in sport activities (Alvarez et al., 2012; Haugen et al., 2020). An adequate motivational climate is dependent on self-determination (Escriva-Boulley et al., 2018; White et al., 2021). Self-determination (Deci & Ryan, 1975, 1985, 2000, 2002) can be defined as an individual's ability to engage in a behavior or action due to a personal commitment to do so. For example, athletes may join a sport organization because they want to learn new skills, understand the importance of being physically active, and see value in engaging with peers. Conversely, athletes may simply engage in sport activities because their parents required them to do so and see no personal value in these experiences.

Self-Determination Theory: Lenses for Conceptualizing Motivation Across Youth Sport Contexts

To foster self-determination in youth athletes is to reflect on the key purpose and mission of organized youth sport. Thus, the ultimate objective of organized youth sport is to provide a firm foundation for young people to become self-determined and engage in a variety of physical activities, as well as to instill a desire for physical activity in their daily routines for the rest of their lives (Gill et al., 2013). Hence, self-determination Theory (SDT; Deci & Ryan, 1985) has been extensively used as an overarching framework to study and understand motivation, especially to map the various levels and forms of motivation toward a range of activities. SDT facilitates a thorough examination about how an individual (e.g., coach, teacher) may foster self-determination and ensure long-lasting physical activity behaviors throughout the life span (Calvo et al., 2010; White et al., 2021). Within SDT, there are several needs, which we will outline below, that are considered pivotal for individuals to become self-determined and more able to change their behaviors (Pelletier et al., 2013). As such, these needs contribute to behavior change, greater well-being, and personal development (Ryan & Deci, 2017).

SDT uses a continuum that includes several factors that aim to explain greater and lesser self-determined forms of motivation (Ryan & Deci, 2007, 2017). Specifically, on one end of the continuum, (1) amotivation is postulated as a lack of will to engage in a behavior/activity; (2) external regulation relates to individuals' ability to engage in a behavior/activity due to rewards or fear of punishment; (3) introjected regulation refers to internal desires and rewards; (4) identified regulation refers to the importance given to a behavior/activity; (5) integrated regulation highlights a personal need to engage in a behavior/activity; and (6) intrinsic motivation, which is the last part of the continuum, refers to one's will, personal interest, and a need to continuously engage in a behavior/activity (Hagger & Chatzisarantis, 2007a, 2007b). *All these factors reflect a fluid set of motivation forms through which individuals navigate* (Hagger & Chatzisarantis, 2007a; Harwood et al., 2015; Hastie et al., 2013; Kirk, 2006; Ryan & Deci, 2017). *This continuum is dependent on three mediating variables*: (a) perceived relatedness which refers to the quality of the relationships established in a setting (e.g., quality of the coach-athlete relationship); (b) perceived competence that alludes to how one perceives their competence in a task or activity (e.g., perceived skill level in a sport), and (c) autonomy that reflects a climate where choices and voices are provided

to participants, as well as active participation is valued and fostered (e.g., creating for athletes to have choices and foster their engagement).

Despite the numerous studies that have been conducted using SDT in organized youth sport contexts (White, 2021), measures available to assess self-determination across socio-cultural contexts are scarce. This is particularly important because there are socio-cultural contexts that have diverse reward systems, competitive structures, and convey different social norms, values, and cultural nuances. It should be noted most studies have been conducted across English-speaking countries (Harwood et al., 2015; Hastie et al., 2013; Kirk, 2006) which, inherently, places other cultures and sport systems in a more fragile position to develop evidence-based practices and instigate positive change. The existence of measures available to assess self-determined forms of motivation across socio-cultural contexts may enable the development of a robust knowledge base that informs research-to-practice partnerships (e.g., Holt et al., 2018a, 2018b) and potential changes across a complex youth sport landscape (e.g., Dorsch et al., 2022).

With this research gap in mind, the purpose of the present study is to validate the Sport Motivation Scale (SMS-II; Pelletier et al., 2013) to the Portuguese context with a sample of adolescent athletes (Junior et al., 2014; Pineda-Espejel et al., 2016). Based on a preliminary attempt made by Rodrigues et al. (2021), this study aims to (a) assess the SMS-II's psychometric properties and (b) test the level of adjustment concerning the variable "gender". Rodrigues' et al. (2021) preliminary attempt included adult athletes. We aim to extend this validation and consider a sample of adolescent athletes because they are at a critical developmental stage whereas organized youth sport should provide just and meaningful opportunities for self-determined forms of motivation to emerge (Telama et al., 2006; Torres & Frías 2023). This is also particularly important due to the fact that Portuguese youth sport has been considered a performance-centered climate (Camiré & Santos, 2019; Santos et al., 2023), specifically a pathway for negative sport experiences that include discrimination (Nery et al., 2019). Therefore, this study will allow for the continued development of the SMS-II which may have numerous applications across youth sports contexts.

Methods

Participants

In total, 239 Portuguese adolescent athletes (132 males and 107 females), aged 12 to 17 years ($M = 14.39$; $SD = 1.35$), participated in the study. These athletes practiced various sports (i.e., handball, athletics, basketball, football, swimming, and volleyball), as well as received primary and secondary education in five schools at the northern and central part of Portugal. These athletes lived in urban areas across five districts. The mean age of our sample was lower than Pelletier's et al. (2013) ($M = 17.41$; $SD = 1.77$). The inclusion criteria were as follows: (a) athletes who actively and frequently participated in youth sport competitive events (i.e., had at least two training sessions and one competitive event per week); and (b) having at least 2 years of competitive experience (the participants had an average competitive experience of 3.46 years; $DP = 1.27$). We tried to use criteria similar to those used by Pelletier et al. (2013) in their original study.

Measures

Sport Motivation Scale-II (SMS-II)

Based on SDT, Pelletier's et al. (2013) developed the SMS-II to evaluate the motivation level of individuals who practice sports. The SMS-II consists of 18 items associated to six subscales that measure the motivational regulations per the self-determination continuum: (1) amotivation (e.g., "I used to have good reasons for doing sports, but now I am asking myself if I should continue"); (2) external regulation (e.g., "Because people I care about would be upset with me if I didn't"); (3) introjected regulation (e.g., "Because people I care about would be upset with me if I didn't"); (4) identified regulation (e.g., "Because I have chosen this sport as a way to develop myself"); (5) integrated regulation (e.g., "Because practicing reflects the essence of who I am"); and (6) intrinsic motivation (e.g., "Because it gives me pleasure to learn more about my

sport"). Athletes were asked to rate on a Likert scale the extent to which the motivations presented to practice sports aligned with their personal motives. Motivation was assessed using a 7-point Likert scale ranging from 1 (do not agree at all) to 7 (totally agree). The authors showed the SMS-II was satisfactorily reliable and valid. Cronbach's alpha values were always greater than .73 for the different factors, as well as the confirmatory factor analysis (CFA) revealed an acceptable fit of the model ($\chi^2(120, N = 206) = 231.88$, $p < .001$; RMSEA = .06; RMSEA 90% CI = .04–.06; CFI = 0.94; NFI = 0.90; and TLI = 0.92). The SMS-II is a valid measure across different studies and socio-cultural contexts such as Brazil, Canada, China, France, Hungary, Mexico, and Spain (Granero-Gallegos et al., 2018; Li et al., 2016; Nascimento et al., 2014; Pelletier et al., 2013, 2019; Pineda-Espejel et al., 2016; Smohai et al., 2021; Viciana et al., 2017).

Sport Participation Survey

Through a survey, data were collected regarding athletes' age, gender, and extracurricular sport activities. This survey assessed the type of sport practiced, number of years in which they regularly participated in competitions, as well as number of training sessions, and weekly competitions.

Procedure

Ethical approval was obtained through the Ministry of Education (Office of Statistics and Educational Planning) before undertaking this research. This procedure follows the current law in Portugal. Because athletes were recruited via schools, school administrators were contacted via telephone and informed about the aims and implications of the study. The athletes' parents were also informed. After obtaining written and verbal informed consent from the school administrators, athletes, and their parents data collection was conducted. The participants were told that they were under no obligation to answer any of the questions if they did not feel comfortable doing so and that they could withdraw from the study at any time. The participants were also assured that their responses would be kept confidential, and this study was not part of any assessment. The surveys were completed during the initial or final part of a physical education class, with at least one of the researchers present to clarify any questions. The survey also included information on the purpose of the study and

provided instructions for participants. The participants took approximately 15 min to answer the questions.

Translation

After obtaining permission from the principal investigator who developed the SMS-II, the measure was translated using the "back-translation" method. This is the most widely used method in the social sciences for verifying the accuracy of the translation for scales and surveys (Douglas & Craig, 2007). We requested two university teachers who were fluent in English to translate the survey into Portuguese; then, we compared these two translations and found no differences. The final Portuguese version was then translated back into English by another university professor. The original version of the measure was compared with the final English-translated version; there were no differences between the two, thus the questionnaire was deemed adequate. The first version was administered to a group of 20 adolescent athletes to see if all the items were clear and suitable. No major questions were raised.

Data Analysis

The psychometric properties of the SMS-II were analyzed through the Analysis of Moment Structures (AMOS) software, Version 24. In the initial phase, the skewness and kurtosis coefficients were examined along with the Mardia (1970) coefficient to examine the univariate and multivariate normality of the distribution of item values, respectively. In univariate normality, items with asymmetry values of higher than 3 (Sk, with $|Sk| > 3$) and kurtosis values of higher than 10 (Ku, with $|Ku| > 10$) are considered to have sensitivity problems (Kline, 2016). The existence of multivariate normality in the data is adequate when the Mardia (1970) coefficient is lower than $p\,(p + 2)$, where p is the number of variables observed (Bollen, 1989). We also attempted to verify the presence of outliers using the squared distance of Mahalanobis (D^2; Kline, 2016).

CFA was performed using the maximum likelihood method to verify the adequacy of the Portuguese version of the SMS-II in terms of the factor structure as proposed by the original authors (Pelletier et al., 2013). To evaluate the quality of the global adjustment of the proposed factor model, the following indexes were used: (a) the ratio between χ^2 and the number of degrees of freedom (χ^2/df); (b) the comparative fit index (CFI; Hu

& Bentler, 1999); (c) the Tucker-Lewis Index (TLI; Tucker & Lewis, 1973); (d) the root mean square error of approximation (RMSEA; Hooper et al., 2008); and (e) the chi-square and the standardized room mean square residual (SRMR; Hu & Bentler, 1999). The model was considered to have an acceptable adjustment when the following values were recorded: $\chi^2/df < 5$; CFI > 0.90; TLI > 0.90; RMSEA < .08; SRMR < 0.08 (Byrne, 2010; Hooper et al., 2008; Hu & Bentler,1999; Kline, 2016).

The construct reliability was estimated using individual (λ^2) and composite (FC) reliabilities. For convergent validity, the average variance extracted (AVE) was calculated for each of the factors with a cut-off point of 0.5 (Hair et al., 2019). The discriminant validity of the factors was assessed by comparing the strokes with the correlation squares between them. For nomological validity, Pearson's correlational analyses were conducted to determine the existence of a simplex-like pattern between subscales to ensure the presence of the variables of the SDT continuum. To examine the invariance of the factor structure for female and male athletes, a multi-group analysis was conducted. Model invariance was conducted by comparing the free model (i.e., factor weights and variances/covariances of free factors) with the constrained model (i.e., factor weights and variances/covariances of the groups). The chi-square value (χ^2) and degrees of freedom were used to verify whether there were possible differences between the models (Kline, 2016).

Results

Preliminary Analyses

Table 1 shows the means and standard deviations of the six subscales that comprise the SMS-II. Preliminary analysis showed that none of the 18 items had asymmetry and kurtosis values that, according to Marôco (2014), suggested *significant deviations from the normal distribution* ($|Sk| > 3$ and $|Ku| > 10$). Regarding multivariate normality, it was found that the Mardia coefficient was 10.3, a value that, from the perspective of Bollen (1989), is lower than $p\,(p + 2)$, where p is the number of variables observed.

Table 1. Average standard deviation recorded in the dimensions of SMS-II

Dimensions	Boys	Girls	Total
Amotivation	2.78 (± 1.86)	2.18 (± 1.43)	2.51 (± 1.70)
External regulation	3.21 (± 1.98)	2.53 (± 1.49)	2.91 (± 1.81)
Introjected regulation	4.41 (± 1.42)	4.00 (± 1.09)	4.23 (± 1.29)
Regulation identified	5.79 (± 1.42)	6.04 (± 1.18)	5.91 (± 1.32)
Integrated regulation	5.71 (± 1.40)	5.99 (± 1.71)	5. 84 (± 1.31)
Intrinsic motivation	5.65 (± 1.42)	5. 74 (± 1.13)	5.69 (± 1.30)

Construct Validity and Reliability

CFA showed an unsatisfactory adjustment quality ($\chi^2(239) = 443.07$; $p < .001$; $\chi^2/df = 3.82$; CFI = 0.90; TLI = 0.87; RMSEA = .10; SRMR = 0.09). Therefore, attempts were made to improve the model's adjustment quality by first eliminating 21 observations whose $D2$ values were revealed to be outliers ($p1$ and $p2$ <.001). Subsequently, efforts were employed to include trajectories between the pair residuals of items that included the same factor, namely, 3 and 17 (intrinsic motivation), 6 and 12 (identified regulation), 7 and 16 (introjected regulation), and 2 and 13 (amotivation). After these changes, the six-factor model showed adequate goodness of fit ($\chi^2(239) = 264.19$; $p < .001$; $\chi^2/df = 2.61$; CFI= 0.95; TLI = 0.93; RMSEA = .06; SRMR = 0.05). The quality of the adjustments found in this study were identical to those found in the original model (Pelletier et al., 2013).

Data on standardized factorial weights (λ), individual reliability of items (λ2), and composite reliability (FC) are presented in Table 2. All items have factor weights greater than 0.50, a value considered acceptable in past research (Hair et al., 2019) and which indicates factor validity. Only item 7 of the "introjected regulation" factor shows a value lower than 0.43. However, we maintained this item in the model because the factorial value was above 0.40, which is deemed acceptable (Hair et al., 2019). The SMS-II subscales showed adequate composite reliability (>0.70). Therefore, these values were adequate for all factors (amotivation = 0.78; external regulation = 0.81; identified regulation = 0.82; integrated regulation = 0.74; intrinsic regulation = 0.77), except for introjected regulation (0.63).

Table 2. Standardized factorial weights, individual item reliability, and composite reliability of the SMS-II dimensions

Factors	Item	λ	λ²	FC
Intrinsic regulation	3	.71	.50	.77
	9	.65	.43	
	17	.61	.37	
Integrated regulation	4	.67	.46	.74
	11	.70	.49	
	14	.79	.62	
Regulation identified	6	.83	.70	.82
	12	.71	.50	
	18	.73	.54	
Introjected regulation	1	.66	.44	.63
	7	.43	.18	
	16	.56	.31	
External regulation	5	.65	.43	.81
	8	.68	.47	
	15	.77	.59	
Amotivation	2	.81	.65	.78
	10	.71	.50	
	13	.68	.46	

λ = standardized factorial weight; λ² = individual item fidelity; FC = composite reliability

Convergent and Discriminant Validity and Correlational Analysis

Table 3 highlights that five of the SMS-II subscales show high values of convergent validity (AVE > .50). However, "introjected regulation" (AVE = .36) shows more fragile values. Concerning discriminant validity, the correlation between the factors is lower than the AVE values of each factor. The correlation matrix reveals the existence of a simplex-like pattern that is consistent with the SMS-II. The self-determined regulations are positively correlated among themselves but negatively correlated with the non-self-determined regulations.

Table 3. Correlations and Average Variance Extracted

Subscale	1	2	3	4	5	6	AVE
1. Amotivation	1						.57
2. External regulation	,46**	1					.59
3. Introjected regulation	,35**	,53**	1				.36
4. Identified regulation	-,21**	-,15*	,19*	1			.62
5. Integrated regulation	-,34**	-,24**	,27**	,76**	1		.50
6. Intrinsic regulation	-38**	-,21**	,30**	,74**	,73**	1	.54

* p<0.05; ** p<0.01; AVE = Average Variance Extracted

Invariance According to Gender

Using a multigroup analysis, we also tried to analyze the existence of variations in the factor structure of the model according to gender. Model invariance was examined by comparing the free model with the constrained model. Per Table 4, the results obtained through the chi-square test show that the model with fixed factor weights (constrained) has a significantly lower adjustment than the free model ($\chi^2/df(24) = 52.82$, $p = .001$). However, there were no significant differences between the model with fixed structural coefficients and the model with free structural coefficients ($\chi^2/df(42) = 71.19$, $p = .073$) which highlights the existence of invariance. There were no significant differences between the averages of female and male athletes ($\chi^2/df(88) = 99.45$, $p = .196$).

Table 4. Multigroup analysis according to gender

Final model	*GL*	CMIN	*p*
Factorial weights	24	52.82	.001
Structural covariance	42	71.19	.073
Average	88	99.45	.196

Findings showed that model variance referred only to the factor weights of some items. Performing a Z test on the equality of structural coefficients showed there were statistically significant differences in the coefficients for the following trajectories: (a) item 3 (intrinsic motivation) ($Z = -2.01$; $p = .05$); (b) item 14 (integrated regulation) ($Z = -1.99$; $p = .05$); (c) item 16 (introjected regulation) ($Z = -2.51$; $p = .01$); (d) item 5 (external regulation) ($Z = -3.69$; $p = .000$); (e) item 8 (external regulation)

($Z = -3.39$; $p = .001$); and (f) item 2 (amotivation) ($Z = -2.08$; $p = .038$). The final model seems to be equivalent for female and male athletes, despite the factor weights of several items indicating variance between the two groups.

Discussion

The purpose of the present study is to validate the SMS-II to the Portuguese context with a sample of adolescent athletes. The Portuguese version, as the original measure, included 18 items that assessed the six forms of motivation proposed by SDT. Our results support a six-factor structure. The procedures used such as the elimination of outlier observations and the correlation between measurement errors of items that were part of the same factor showed the presence of a six-factor model with a good adjustment quality. Our indicators of adjustment quality were similar to those observed by Pelletier et al. (2013). Composite reliability, convergent validity, and discriminant validity were also adequate. However, the factor "introjected regulation" showed weak composite reliability and AVE which supports the findings from previous studies (Granero-Gallegos et al., 2018; Li et al., 2016; Nascimento Junior et al., 2014; Pelletier et al., 2019; Pineda-Espejel et al., 2016; Smohai et al., 2021).

Gender invariance analysis showed that the structure of the six-factor model was generally equivalent for both female and male athletes which supports previous studies that have indicated the SMS-II has a good adjustment quality for gender (e.g., Rodrigues et al., 2021; Viciana et al., 2017). Findings also showed that autonomous regulations were positively correlated among themselves. Conversely, controlled regulations were negatively associated with global autonomous regulations. Overall, these findings were consistent with the simplex-like pattern observed in the studies conducted by Pelletier et al. (2013, 2019). The only finding that contradicts the principles and notions conveyed within SDT refer to intrinsic motivation which shows a stronger correlation with integrated regulation rather than with identified regulation. The present study supports the reliability and validity of the Portuguese version of the SMS-II which can help assess self-determined forms of motivation across the organized youth sport landscape.

Practical and Theoretical Implications

In Portugal (as in other countries), physical activity levels have decreased substantially over the last years (Mota et al., 2018), as well as negative sport experiences amongst youth have increased, including episodes of bullying (e.g., Nery et al., 2019). These factors have made researchers develop resources (e.g., novel measures, innovative research protocols) to understand how to create better sport experiences for youth and increase self-determined forms of motivation. Taken together, these efforts have been employed to help mitigate negative outcomes such as the ones outline at the onset of this section. Considering these contextual factors, the SMS-II has the potential to be used within the Portuguese youth sport landscape in diverse ways. These recommendations may also instigate discussions and reflections across other socio-cultural contexts.

First, researchers may use the SMS-II to diagnose athletes' motivations across a range of coaching contexts (e.g., competitive, recreational) with the aim of understanding youth sport coaches' effectiveness in developing strategies that contribute toward *perceived relatedness, perceived competence, and the creation of an autonomy climate*. These three factors are critical to increase sport participation rates, as well as provide meaningful sport experiences. Additionally, it is also important to acknowledge that, beyond the coach, a multitude of actors contribute to the emergence of self-determined forms of motivation such as parents and sport administrators. The youth sport system is indeed influenced by several social and cultural forces (e.g., reward systems, organizational values, social norms) that determine how performance, development, and motivation are positioned (Dorsch et al., 2022). Second, researchers and practitioners may also need to reflect on *why* specific forms of motivation are more prevalent in certain coaching contexts and prompt discussions around the value system in place. To better examine and understand trends concerning motivation toward youth sport participation, researchers may need to delve into other fields and disciplines such as sport sociology and social work to understand the pitfalls of the current youth sport system (Santos, 2022). For instance, through the lenses of social justice, it is possible to reflect about how the current gender inequities across Europe (Emmonds et al., 2023) may have a relationship with female athletes' motivation toward sport. Subsequently, youth sport organizations may need to invest more time and effort in supporting self-determined forms of motivation amongst female athletes. Third, coach education offerings may be strategically used to help youth sport coaches develop strategies and novel pedagogical approaches that contribute to self-determined forms of motivation. Indeed, the SMS-II can be used as an applied resource to help set objectives and

contents for coach education programs across Portugal. However, within the Portuguese landscape, research has shown that most coach education offerings are centered around performance which may hinder coaches' effectiveness toward inducing self-determined forms of motivation (Santos et al., 2023).

Finally, policy makers may need to focus on the outputs derived from the SMS-II to evaluate and fund youth sport organizations. Simply assessing youth sport organizations' effectiveness through the number of participants in a given sport may have numerous limitations. One of the main limitations is the fact that some sports may never have a high number of participants. For example, football in Portugal is the only sport above the 200,000 participants mark (Carvalho, 2022). However, despite having much less participants, rowing coaches may be developing positive strategies that lead to self-determined forms of motivation. In other words, policy makers, with the help of researchers, may need to carefully tailor sport policies and funding requirements to meet the standards for expected behaviors and practices concerning motivation (Whitley et al., 2020). Moving forward, the SMS-II can be of value both from a practical and theoretical standpoint and influence youth sport organizations' practices, as well as research programs.

Conclusions

This study investigated the psychometric properties of the SMS-II based on the validation study conducted by Rodrigues et al. (2021). There are a few limitations that need to be acknowledged: (i) this is a cross-sectional cohort study; and (ii) convenience sampling was used and only a part of the Portuguese territory was covered. These limitations limit the generalizability of the results. Therefore, researchers should further examine the psychometric properties of the SMS-II. Future research should utilize a larger and randomly selected sample that is more heterogeneous in terms of participants' ages, ethnicities, sports, and backgrounds. *It is also important to understand why the factor "introjected regulation" has such a low composite reliability and AVE which is an issue that requires further attention.* Finally, future studies could use the SMS-II to understand youth's motivation across organized youth

sport and subsequently inform coach education programs, policy changes and instigate reflections on how to develop novel strategies for coaching practice. This is our humble challenge for researchers across the Portuguese youth sport system and elsewhere—examine athletes' experiences and reflect on how to better structure organize youth sport in a complex post-pandemic landscape.

Study 5

Motivational Climate and Attitudes towards Physical Education: Implications for Student Engagement in Community Youth Sport

Abstract

Within contemporary society, youth's physical literacy has decreased considerably, largely due to the lack of quality physical education and sport programming. Quality physical education and sport programming is contingent on multiple processes and attached to several desired outcomes such as the development of an appropriate motivational climate and positive attitudes towards physical education. Therefore, the purpose of the present study was three-fold: (a) assess students' varying motivations towards engagement in community sports in relation to age and gender; (b) examine the relationship between students' perceptions towards the motivational climate in physical education classes and their attitudes towards physical education; and (b) analyze the influence of students' attitudes towards physical education and their motivation to engage in community sports. A total of 288 Portuguese adolescent students participated in the present study (155 males = 53.8%; 133 females = 46.2%), aged 12-17 years old. Findings highlight the fact this sample of Portuguese adolescent students showcased higher levels of intrinsic motivation than extrinsic motivation. Moreover, findings also showcased that mastery-oriented climates have a significant influence on students' attitudes towards physical education, which also positively

influenced intrinsic motivation towards participation in community youth sport programs. Collaborative efforts to design physical education and community youth sport programs that include policymakers, administrators, as well as teachers and coaches may need be needed. Such collaborative efforts may create solid grounds for *programmatic redundancy*, which translates into consistent, articulated and coherent plans and strategies employed by schools and youth sport organizations.

Keywords:

Policy; youth; sport; development; pedagogy.

Introduction

Within contemporary society, youth's physical literacy has decreased considerably, largely due to reduced and thus insufficient physical activity (PA) levels as well as the lack of quality physical education and sport (PES) programming (Guthold et al., 2018; Johnson & Ginicola, 2021; Mazzoli et al., 2024). To overcome these trends, scholars have deployed efforts within schools, community youth sport organizations and across socio-cultural contexts with the purpose of increasing youth's physical literacy, PA levels as well as fostering positive youth development outcomes such as social responsibility and prosocial behaviors (e.g., Fredrick et al., 2022; Martinek & Hemphill, 2020). Nonetheless, these applied efforts have been unable to help overcome the trends described previously. Indeed, the decline in PA levels can have negative consequences on physical and mental health (Rhodes et al., 2017), particularly across youth cohorts (Guthold et al., 2020). Health issues often associated with physical inactivity and a sedentary lifestyle include obesity and mental health risks (Bedard et al., 2022; Sañudo et al., 2024).

Taken together, despite there is an evident need for quality PA and PES programming, efforts to change the status quo have been somewhat ineffective (Bruner et al., 2023; Iglesias et al., 2023; Lee et al., 2016) due to several interrelated and systemic factors that warrant attention. For instance, policymakers have centered their attention on quantifying PA and PES programming instead of facilitating quality PA and PES programming that fits the needs of socio-cultural contexts (Malcolm et al., 2023). PA and PES programming have indeed been considered unjust and de contextualized. As highlighted by Malcolm et al. (2023) "guideline development should be more inclusive, embrace different types of evidence and disciplinary perspectives, and contribute to the ongoing de-colonisation of global public health" (p. 605). Moreover, the marginalization of physical education across society and schools has hindered teachers' efforts towards quality programming and inherently negatively impacted student outcomes (Shirotriya & Beighle, 2023). Also, the COVID-19 pandemic has intensified these issues and created additional challenges to the feasibility of quality PA and PES programming (Blain et al., 2022; Varea et al., 2023).

Quality PA and PES programming is contingent on multiple processes and attached to several desired outcomes such as the development of an appropriate motivational climate (Huhtiniemi et al., 2022; Pereira et al., 2021; Pons et al., 2023) and positive

attitudes towards physical education (Baek & Kim, 2024; Silverman, 2017), respectively. If students are to adopt an active lifestyle and adhere to PA, particularly partake in community youth sport programs carefully attention is needed towards these two variables (Burns et al., 2023).

The motivational climate experienced in physical education settings is paramount for students to engage in PA and community sport programs (Pons et al., 2023). To better understand the motivational climate, scholars have developed several theories to map and situate relevant variables such as achievement goal theory (Nicholls, 1984) and self-determination theory (Deci & Ryan, 1985). Achievement goal theory is based on the premise that individuals engage in PES due to perceived competence and motivational climate. Perceived competence is guided by task-orientation (i.e., competence is contingent on individual progress) or ego-orientation (i.e., competence is normative and always associated with the competence of others; Roberts, 1992). Moreover, achievement goal theory considers motivational climate as a situational variable (Jaakkola et al., 2016). Ego-oriented performance climates tend to hinder students' attitudes towards PES (García-González et al., 2019). Conversely, task-oriented mastery climates reflect supportive motivational climates whereas students present increased levels of engagement and positive attitudes towards physical education (Pereira et al., 2023). Therefore, attitudes towards PES are influenced by how teachers structure the motivational climate (İlker & Demirhan, 2012).

Another theory that has been used to examine motivational climates is self-determination theory (Deci & Ryan, 1985). Self-determination theory can help provide guidelines towards the processes and mechanisms associated with intrinsic motivation within PES programming (Llanos-Muñoz et al., 2023; Sun et al., 2017). To foster intrinsic motivation, individuals must fulfill their needs for autonomy, relatedness and positive social relationships (Saugy et al., 2019). Hence, self-determination moves across the motivational spectrum that involves amotivation (absence of motivation to engage in an activity), extrinsic motivation (i.e., reward-driven motivation towards an activity) and intrinsic motivation (i.e., self-determined motivation). Based on these notions, previous studies have attempted to examine students and teachers' perceptions concerning the motivational climate within PES programming (Leo et al., 2020; Ntoumanis & Standage, 2009; Ulstad et al., 2018). However, there are pitfalls that must be considered moving forward.

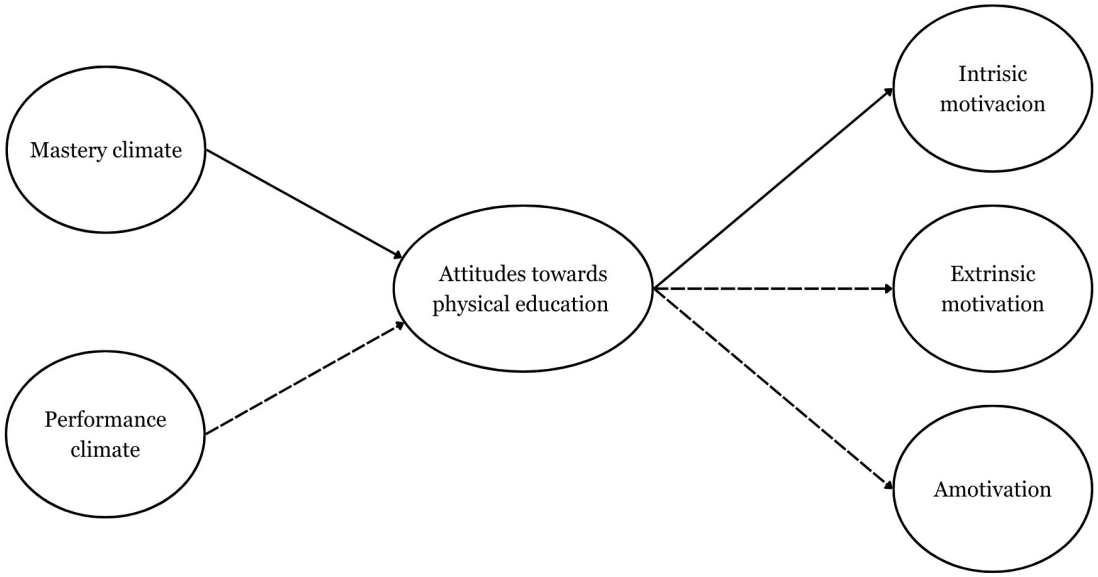
Despite these advances in scholarly work and teaching practice, there are still limitations in current research efforts that warrant attention if scholarly work is to

meaningfully impact PA levels and engagement in community youth sport programs. First, there is a scarcity of studies that have examined the association between students' perceptions towards the motivational climate, attitudes towards physical education and participation in community youth sport programs as interrelated variables (Bryan & Solmon, 2012; Gutiérrez et al., 2018). Such understanding is critical to enhance scholars' understandings about PES programming within and outside the school environment, which can yield relevant insights for more socially just policy development processes, teacher education programming and quality teaching practice (Brinkley, 2024; Kirk, 2005). Second, more research is also needed across diverse socio-cultural contexts where social norms, policies, culture and teacher-student interactions have different nuances, which can inherently have an impact on the aforementioned variables (e.g., Chen et al., 2020; Pereira et al., 2023). There is a contemporary research agenda that has pushed the needle towards examining non-English speaking countries as a way to extend changes to less privileged school settings. The present study represents a way to provide voices to actors that have been in some cases marginalized and erased from discussions on PA and PES. Finally, efforts to decenter research from teachers and focus on students is a needed step to enable scholars to understand how youth position PES programming and its impacts (Russell, 2016).

Purpose

Therefore, the purpose of the present study was three-fold: (a) assess students' varying motivations towards engagement in community sports in relation to age and gender; (b) examine the relationship between students' perceptions towards the motivational climate in physical education classes and their attitudes towards physical education; and (b) analyze the influence of students' attitudes towards physical education and their motivation to engage in community sports. To achieve (b) and (c), a structural equation model (SEM), which suggests that the motivational climate in physical education classes and students' attitudes towards physical education are predictors of motivation to engage in community sports was utilized (see Figure 1).

Figure 1. Hypothetical relationships model between motivational climate, students' attitudes towards physical education and motivation for engaging in community sport



Methods

Sample

A total of 288 students participated in the present study (155 males = 53.8%; 133 females = 46.2%), aged 12-17 years old (M = 14.56; SD = 1.38), attending the 7th, 8th and 9th grades of five secondary schools located in urban areas within five districts in northern and central Portugal. These students engaged in various sports such as handball, athletics, basketball, football, swimming and volleyball, and had on average 3.27 years of experience in community sport programs (DP = 1.45).

Procedure

Ethical approval was attained from the Portuguese Ministry of Education (Office of Statistics and Educational Planning). Then, school administrators were contacted via phone and/or email, as well as informed about the aims and implications of the present study, in order to obtain permission to collect data. Subsequently, parents and students were contacted and briefed about the study's aims and implications. To participate in

the present study, students needed to be involved in community sports for at least a year. Students were informed they were not obliged to answer any of the questions if they did not feel comfortable, and that they could withdrawal from the study at any time. Moreover, students were also informed that the study was not part of any assessment from their teachers. Once parents and athletes agreed to participate in the present study, data collection was conducted at the beginning or at the end of a physical education class.

Data Collection

Attitudes towards physical education

Students' attitudes towards physical education were assessed using the Portuguese version of the Student's Attitudes towards Physical Education questionnaire (SAtPE; Subramaniam & Silverman, 2000), adapted and validated by Pereira et al. (2020). In this instrument, attitudes are conceptually understood as a construct with two components: cognitive (perceived usefulness); and affective (pleasure). The cognitive component refers to beliefs about the characteristics of the attitude object while the affective component assesses the degree of emotional attraction or feeling towards an attitude object (Subramaniam & Silverman, 2007). Each of these components contains two sub-factors which are the teacher and the curriculum. Therefore, the SAtPE consists of 20 items, 8 of which are worded negatively. The answers to the items are presented on a 5-point Likert scale ranging from totally disagree (corresponding to 1 point) to totally agree (5 points). Thus, the score on the questionnaire can range from a minimum of 20 to a maximum of 100 points. The higher a student's score, the more positive their attitude towards PE is.

Motivational climate in physical education

Students' perceptions of the motivational climate in physical education were assessed using the Portuguese version of the English version of the Echelle de Perception du Climat Motivational (EPCM; Biddle et al., 1995), adapted and validated by Pereira et al. (2022). This questionnaire contains 19 items and was developed with the aim of

assessing the extent to which students perceive the motivational climate in physical education classes to be mastery-oriented or performance-oriented (Standage et al., 2003a, 2003b). It includes five first-order factors: (1) 'pupil's pursuit of progress' (5 items); (2) 'teacher's promotion of learning' (4 items); (3) 'pupil's pursuit of comparison' (3 items); (4) 'teacher's promotion of comparison' (3 items); (5) 'worrying about making mistakes' (4 items). The first two factors are part of a second-order factor called 'mastery climate', while the remaining three are included within the 'performance climate'. The questionnaire includes a 5-point Likert scale ranging from strongly disagree (1) and strongly agree (5).

Motivation for sport practice

The Portuguese version of the Sport Motivation Scale II (SMS-II, Pelletier et al., 2013), adapted and validated by Pereira et al. (2024) and Rodrigues et al. (2021) was used to examine students' motivation to engage in community sports. The SMS-II consists of 18 items, which are grouped into six subscales that measure motivational regulation situated on the self-determination continuum: (a) amotivation; (b) extrinsic regulation; (c) introjected regulation; (d) identified regulation; (e) integrated regulation; and (f) intrinsic motivation. Students are asked to state the extent to which their reasons for engaging in community sports correspond to their own personal reasons. Motivation is assessed using a 7-point Likert scale ranging from 'does not fully correspond' (1) to 'fully corresponds' (7). Based on the purpose of this study, only three dimensions of SMS-II were used: intrinsic motivation, external regulation and demotivation.

Data Analysis

Based on the study's purposes, a descriptive analysis of the data was conducted to assess the mean and standard deviation concerning the three subscales of the SMS-II: intrinsic motivation, extrinsic motivation and demotivation. Differences in students' motivation to engage in community sports in relation to age and gender were determined through the analysis of variance (ANOVA). Once the ANOVA was significant, the Sheffe's post-hoc test was utilized.

The usage of SEM enabled the research team to develop a series of analytical steps to confirm the type and direction of the relationships between the variables that are

present in the model (see Figure 2). The fit indices used were the ratio between χ^2 and the number of degrees of freedom (χ^2/df), the CFI (comparative fit index), the TLI (Tucker-Lewis Index) and the RMSEA (root mean square error of approximation). The model was considered to have an acceptable adjustment when the following values were recorded: χ^2/df < 5; CFI > 0.90; TLI > 0.90; RMSEA < .08 (Byrne, 2010; Hooper et al., 2008; Hu & Bentler,1999; Kline, 2016). To examine causal relationships between variables, a multiple regression analysis was conducted.

Results

Descriptive Statistics

Table 1 presents the average scores across the three dimensions of the SMS-II. Findings highlight that students have higher levels of intrinsic motivation (*M* = 17.22; *SD* = 4.13) than extrinsic motivation (*M* = 8.76; *SD* = 5.54), as well as showed low levels of demotivation (*M* = 7.72; *SD* = 5.00).

Table 1. Mean and standard deviation associated with the dimensions of the SMS - II

Dimensions	Boys	Girls	Total
Demotivation	8.50 (± 5.48)	6.82 (± 4.22)	7.72 (± 5.00)
External regulation	9.83 (± 5.78)	7.52 (± 4.99)	8.76 (± 5.54)
Intrinsic motivation	16.90 (± 4.30)	17.60 (± 3.90)	17.22 (± 4.13)

The analysis of variance (one-way ANOVA) showed that there were statistically significant differences between the values associated with intrinsic dimension and those for external regulation (t = 5.67; df = 15; p = .046), as well as concerning demotivation (t = 9.23; df = 15; p = .000). Moreover, there were no significant differences in intrinsic motivation [F (5,281) = 1.23; p= ns] and demotivation [F (5,280) = 2.14; p= ns] according to age. However, there were differences in external regulation in relation to age [F (5,281) = 3.14; p< .01]. Hence, Sheffe's post-hoc test showed significant differences (p< .001) between students aged 12 (*M*= 10.63; *SD*=

5.18) and 14 (*M*= 7.51; *SD*= 5.60). Interestingly, with regards to gender male students obtained significantly higher average scores than females on the demotivation subscale [F (1,285) = 8.26; p< .01] and the external regulation subscale [F (1,286) = 13.01; p< .001]. As for intrinsic motivation, there were no statistically significant differences between the two groups [F (1,286) = 2.09; p= ns].

Correlations

Correlations between the factors of the three scales were assessed (SApTE, EPCM and SMS-II; see Table 2). Findings showed there was a positive correlation between the following EPCM factors: (a) 'pupil's pursuit of progress'; (b) 'teacher's promotion of learning'; and (c) 'pupil's pursuit of comparison'. The remaining EPCM factors were also positively correlated. Also, there was an association between 'pupil's pursuit of comparison' and 'teacher's promotion of comparison'.

Table 2. Correlations between the variables associated with the model

	1	2	3	4	5	6	7	8	9	10	11
1											
2	,54**										
3	,33**	,39**									
4	,06	,11	,15*								
5	,13	,12	,09	,14*							
6	,67**	,61**	,18**	-,04	,07						
7	,61**	,53**	,14*	-,09	-,04	,79**					
8	,64**	,62**	,17**	-,06	,08	,84**	,77**				
9	,62**	,47**	,16**	-,03	-,09	,78**	,73**	,76**			
10	,28**	,23**	,12	-,05	-,15*	,21**	,25**	,09	,14*		
11	-,01	,07	,10	,16*	,23**	,10	,11	-,16*	,08	-,21**	
12	-,03	,06	,09	,19**	,14*	,06	,09	-,11	,07	-,37**	,75**

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

1. Pursuit of progress by pupils; 2. Promotion of learning by teacher; 3. Pursuit of comparison by pupils; 4. Promotion of comparison by teacher; 5. Worries about mistakes; 6. Attitudes pleasure professor; 7. Attitudes pleasure curriculum; 8. Attitudes usefulness professor; 9. Attitudes usefulness curriculum; 10. Intrinsic motivation; 11. Extrinsic motivation; 12. Amotivation.

The four factors associated with attitudes towards physical education were also strongly and positively correlated with each other. Moreover, intrinsic motivation for engaging

in community sports was negatively associated with extrinsic motivation and demotivation. Also, there was a strong positive correlation between extrinsic motivation and demotivation.

The variables 'pupil's pursuit of progress', 'teacher's promotion of learning' and 'pupil's pursuit of comparison' were positively associated with all the factors related to attitudes towards physical education. Moreover, there was also a positive relationship between 'pupil's pursuit of progress' and 'teacher's promotion of learning', as well as between these variables and intrinsic motivation. Conversely, 'teacher's promotion of comparison' and 'worrying about making mistakes' were positively correlated with extrinsic motivation and demotivation. It should also be noted the three factors associated with attitudes towards physical education (i.e., teacher enjoyment, curriculum enjoyment and curriculum usefulness) were positively correlated with extrinsic motivation. On other hand, the 'teacher usefulness' factor was negatively correlated with extrinsic motivation.

Predictability of Motivations to Engage in Community Sport

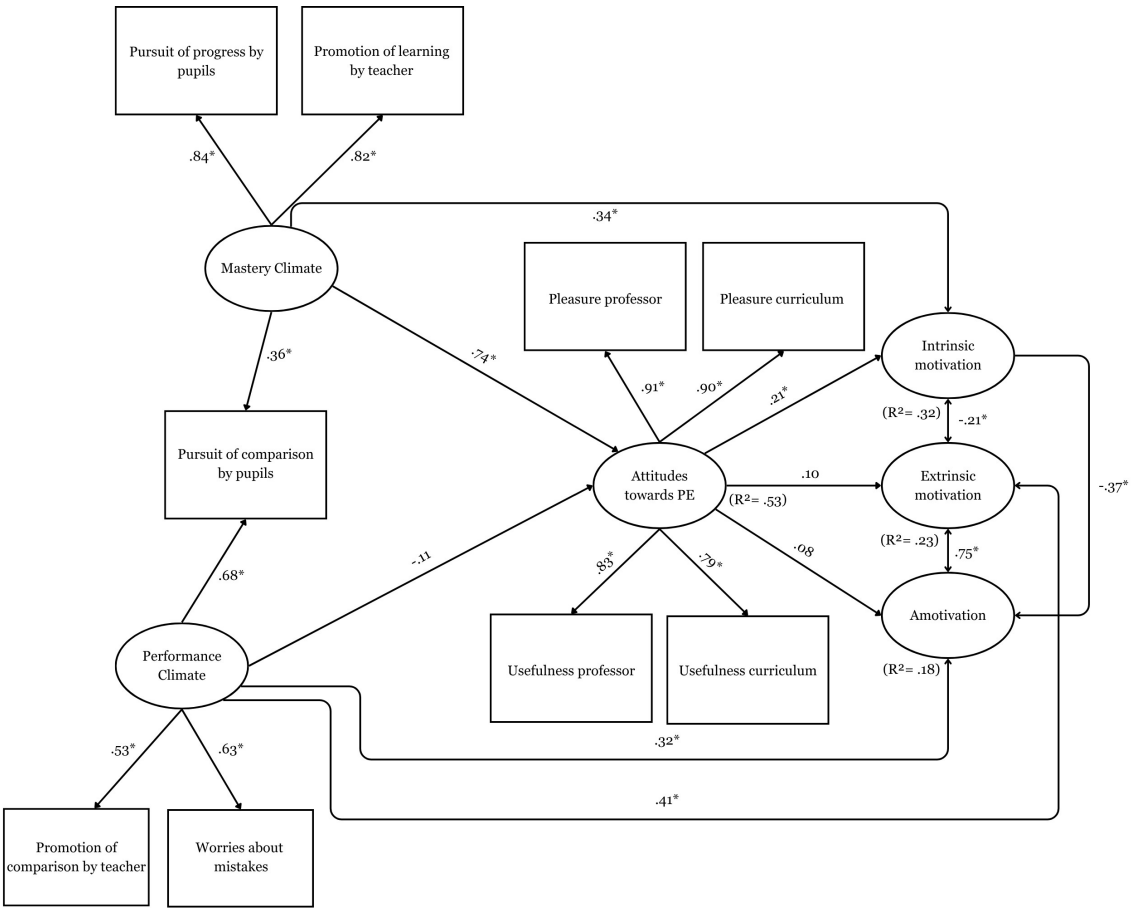
In the initial model, it was thought that the motivational climate in physical education classes was associated with student attitudes. Moreover, student attitudes were considered to be a predictor of the reasons that lead students to partake in community sport programs. However, findings showed that this model presented an unsatisfactory quality of fit {χ^2 (96) = 408.52; χ^2/df = 4.26; CFI = .76; TLI = .73; RMSEA = .11; [90% CI; .09 - .12]}. In order to improve the quality of fit, certain non-significant relationships were eliminated. This resulted in a model with an acceptable fit when comparing with the original version {χ^2 (62) = 140.35; χ^2/df = 2.34; CFI = .88; TLI = .86; RMSEA = .06; [90% CI; .04 - .05]}.

Concerning the standardized factor weights, their values vary between .36 and .91. In light of the relationships between factors, the climate of mastery in physical education classes was positively correlated with students' attitudes (β = .74) and intrinsic motivation (β = .37). Conversely, the performance climate was associated with external motivation (β = .33) and demotivation (β = .28). Students' attitudes towards physical education were associated with intrinsic motivation (β = .21).

In order to examine the predictors of students' attitudes towards physical education, as well as their motivations for practicing community sports, a multiple regression

analysis was conducted. Findings highlight that students' perceptions of a mastery climate explain 53% of the variance in their attitudes towards physical education. Student attitudes were not influenced by students' perceptions about the existence of a performance climate. Conversely, a mastery climate and student attitudes were able to explain 32% of the total variance in intrinsic motivation to engage in community sports. A performance climate is a predictor of extrinsic motivation and demotivation, with 23% and 18% of the variance, respectively.

Figure 2. Results of the proposed model for predicting motivations for engaging in community sport through motivational climate and students' attitudes towards physical education



* p< .05

Discussion

The purpose of the present study was three-fold: (a) assess students' varying motivations towards engagement in community sports in relation to age and gender; (b) examine the relationship between students' perceptions towards the motivational climate in physical education classes and their attitudes towards physical education; and (b) analyze the influence of students' attitudes towards physical education and their motivation to engage in community sports. The present study can yield meaningful implications for PES programming, particularly concerning the transfer of motivation processes from-within physical education to community youth sport programming. Such an holistic and integrated approach towards PES participation can help policymakers, schools and sport administrators, as well as teachers, coaches and other decision makers create quality environments that translate into long-lasting participation and the adoption of a healthy lifestyle, as well as multiple positive outcomes (Bandeira et al., 2023; Dudley et al., 2011; Owen et al., 2022)

Findings highlight the fact this sample of Portuguese adolescent students showcased higher levels of intrinsic motivation than extrinsic motivation, which can be interpreted by considering diverse variables that determine quality physical education programming. Physical education teachers' ability to fulfill students' needs for relatedness, autonomy and increased perceived competence is known to be paramount for intrinsic motivation amongst youth cohorts (Llanos-Muñoz et al., 2023; Saugy et al., 2019; Sun et al., 2017). Previous studies have emphasized the need for physical education teachers to create a mastery-oriented climate instead of a performance-oriented one by relying on autonomy supportive behaviors (Abós et al., 2022; Carcamo-Oyarzun et al., 2023; Estevan et al., 2020; Simonton et al., 2024). Hence, a mastery-oriented climate can provide meaningful opportunities for students to become intrinsically motivated towards PES (Fernández-Bustos et al., 2024), which may help explain these findings.

Nonetheless, the Sheffe's post-hoc test showed significant differences concerning external regulation between students aged 12 and 14, which may warrant attention. Notably, variations regarding students' external regulation indexes throughout adolescence may reflect different teachers' profiles and behaviors (Burgueño et al., 2022; De Meyer et al., 2016). It should be noted that teachers, including physical education teachers, within the Portuguese educational system have in many cases

unstable positions and rarely stay in same school for extended periods of time, which can impact their well-being and burnout (Mota et al., 2021; Castro Silva et al., 2023). Hence, such unstable career prospects can help explain why there may be varying teaching practices, motivational climates and students' external regulation indexes. Can a physical education teacher who faces unpredictability (e.g., employment, school, housing, family life), lacks organizational support (e.g., motivations and rewards to develop quality programming), as well as faces challenges in terms of their well-being and burnout create positive motivational climates? Thus, mastery-oriented climates and intrinsically motivated students may also come at the cost of appropriate working conditions.

Moreover, physical education teachers who resort to need-thwarting behaviors, particularly autonomy thwarting, competence thwarting and relatedness thwarting may create environments contingent on external regulation that may subsequently lead to amotivation. Based on previous notions, is it probable that amotivated physical education teachers foster positive motivational climates? A more ecological understanding about students' perceptions and teaching practices may be needed. Beyond curriculum-centered approaches towards increasing the quality of PES programming, efforts may need to be deployed towards understanding the processes and mechanisms associated with a pedagogy that prioritizes students' needs and interests as active learners, as well as that enables them to explore possibilities to move bodies across diverse spaces-times (Moy et al., 2015). It should be noted that scholars across diverse socio-cultural contexts have raised the need to consider how politics, social norms and culture impact PES programming, and enable-hinder meaningful opportunities for youth development (Annerstedt, 2008; Chepyator-Thomson, 2014; Evans, 2014).

Interestingly, male students obtained significantly higher average scores than females on the demotivation and external regulation subscales. Previous research has highlighted that girls (a) experience higher levels of demotivation and external regulation than boys, as well as (b) suffer discrimination and face negative experiences in PES (e.g., power of heteronormative communication; Brazier et al., 2025; Organista et al., 2024), which does not corroborate this finding. It is important to note that PES programming can also place pressures on youth (e.g., performance-oriented climates, normative comparisons), create negative environments (e.g., unhealthy masculinity) and induce need-thwarting behaviors, which may also impact male students. Indeed, PES has been postulated as a gendered and heteronormative discipline that can harm diverse youth cohorts (Metcalfe, 2018; Mitchell et al., 2013). The fact that boys have in

some cases additional opportunities to develop in physical education when compared to girls, because they are more competitive, fully able and competent may also help explain this finding (Hortigüela-Alcalá et al., 2021). By upholding a masculinized physical education subculture, teachers may be placing significant pressures on boys when compared to girls and impacting their motivation, which is cause for concern.

Additionality, findings highlighted that mastery-oriented climates have a significant influence on students' attitudes towards physical education, which also positively influenced intrinsic motivation towards participation in community youth sport programs, which is supported by previous studies (Farias et al., 2019; Säfvenbom et al., 2014; Wallhead et al., 2014). These findings highlight the need to position physical education-community youth sport programs as inseparable variables in terms of policy, research and practice (Kay et al., 2024). Extending Kay's et al. (2024) arguments on the need to revisit the concepts of youth sport participation, retention, and dropout, efforts may also need to be developed towards investigating and intervening with physical education-community youth sport programs. Such an integrated approach to understand motivational processes and attitudes may help reduce sustained disengagement and dropout across diverse youth cohorts (Emmonds et al., 2023; Moulds et al., 2022). Collaborative efforts to design physical education and community youth sport programs that include policymakers, administrators, as well as teachers and coaches may need be needed. Such collaborative efforts may create solid grounds for *programmatic redundancy*, which translates into consistent, articulated and coherent plans and strategies employed by schools and youth sport organizations. The entanglement between policy-research-practice needs to be carefully considered in order to support PES to overcome contemporary challenges such as students' amotivation and physical inactivity (Van der Mars, 2018).

Findings showcase that performance-oriented climates do not have a statistically significant relationship with positive attitudes towards physical education. Moreover, positive attitudes towards physical education did not have a significant relationship with extrinsic motivation and amotivation. Thus, one might question: how does performance and competition (i.e., when used to focus on results and winning) become relevant for PES programming? Indeed, scholars have argued the need to develop pedagogical approaches centered on students, their needs and interests (Metz et al., 2024). Current trends regarding physical (in)activity, dropout and participation in community youth sport programs may facilitate an understanding about how teaching practice has yet, in some cases, to follow evidence-based recommendations and impact the status quo (Emmonds et al., 2023).

Conclusions

The present study inherently includes several limitations that need to be acknowledged. First, the characteristics of the sample impact the extent to which these findings can be generalizable and are representative of diverse populations cohorts (e.g., diverse gender identities, sexual orientations, ethnicities/races). Second, the characteristics of the sample (e.g., Portuguese districts represented) also impact the extent to which certain inferences can be made. Finally, aligning teachers' and students' perceptions could have enabled a better comprehension of PES programming.

In light of the findings of the present study, efforts may be needed towards creating mastery-oriented climates across PES programming that can (a) induce positive attitudes towards physical education; (b) help students become intrinsically motivated towards PES and sustain such motivation, as well as (c) facilitate engagement in community youth sport programs. To achieve such outcomes, *programmatic redundancy* may serve the purpose of aligning agendas, organizational plans and pedagogical practices. Moving forward, future studies may attempt to understand how working conditions amongst other socio-cultural factors impact teachers and coaches' practices towards creating positive motivational climates, as well as students' perceptions. Studies that examine if/how *programmatic redundancy* occurs across socio-cultural contexts may also be needed. Such studies could assess the relationship between *programmatic redundancy* and students' perceptions of attitudes towards physical education and motivation towards PES. Ultimately, more research that considers geopolitical and socio-cultural variables is needed to enable a comprehensive understanding of the entanglement between policy-research-practice. Hopefully, the present study can serve a prompt to challenge scholars to question the status quo and increase opportunities for youth to develop, become healthy, as well as live sustainable and fulfilling lives.

Chapter 4. General Discussion

The main objectives of the present thesis were (a) to understand students' attitudes towards PE, (b) analyze students' perceptions about the motivational climate in PE, as well as (c) to examine the relationship between students' attitudes, motivational climate and engagement in PE and sport settings. Based on the current state of affairs within the Portuguese context, this thesis can instigate meaningful reflections concerning how to develop additional efforts towards fostering quality PE programming – a needed prerogative within the Portuguese educational system.

Quality PE programming entails diverse multiple macro, meso and micro-level variables (Hastie & Siedentop,1999). Although the focus of the present thesis was not on macro and meso-level variables, it is important to highlight the relevancy of social norms, culture and policy (i.e., macro-level variables) in shaping what PE is and can become in the Portuguese context. Throughout the last decades, there have been numerous calls, discourses and even research studies that have alluded to the urgency of changing teaching practices, teacher education and the physical education curriculum (e.g., Marmeleira et al., 2019). Nonetheless, there have been minor changes to the current status quo in PE (Onofre et al., 2017). There seems to be a recurrent discourse with regards to what PE should be that does not translate into better student learning outcomes, increased health benefits and overall quality of life.

To understand and measure these outcomes, micro-level variables such as students' attitudes and motivation play a role in identifying if/how PE is of appropriate quality and induces meaningful outcomes (e.g., Manninen & Campbell, 2022; Moreno-Murcia et al., 2013; Säfvenbom et al., 2014) – the focus of the present thesis. Findings do not support that current PE programming is doing enough to attain better student outcomes. Moreover, there is also an evident need to further conduct research within the Portuguese context to advance in-depth understandings about the potential contributions of PE towards youth development, learning and health. On this notion, many scholars have provided critical insights about the state of PE, teacher training and policies, but only few have indeed devoted the time to develop a body of literature capable of assessing micro-level variables and providing evidence-based guidelines moving forward (Onofre et al., 2017). Indeed, PE has become the panacea for critique and public judgement, but as a field lacks contextualized research efforts that can build

a constructive dialogue moving forward that leads to a paradigm shift in Portugal, which is an urgent demand.

Findings reinforce the need to create solid grounds from teachers to create appropriate motivational climates that can generate positive attitudes towards PE, which requires adequate policies, organizational philosophies and teacher training programs. An integrative outlook towards variables such as policy, curriculum, teachers' instructional efforts, student outcomes and teacher education can indeed influence motivational climate and attitudes toward PE. Conversely, teacher-centric approaches may place too many pressures and responsibilities on teachers who are influenced by multiple socio-cultural variables and hold limited and contingent agentic capacities. On this notion, students' understandings and perceptions emerge as relevant measures of quality PE programming that examine the center of the learning process – the student.

Therefore, the first study that includes a narrative review, and two critical commentaries enabled the authors to (a) understand the value and limitations of previous literature within this line of inquiry and (b) engage in theory-driven reflections to provide valid alternatives for the field and call attention towards the multilayered and multifactorial nature of motivational climates and attitudes towards PE. Subsequently, the remaining four empirical studies (i.e., studies 2,3,4 and 5) enabled and provided an overview of how motivational climates and attitudes towards PE are associated with relevant student outcomes. These findings can contribute to inspire more research to be conducted within the Portuguese context and ensure PE fulfills its mission and contribute to changing the current status quo that includes substantial decreases in physical activity in the general population.

To further researchers' understandings of and about motivational climates and attitudes towards PE it may be necessary to deploy integrative or perhaps ecological perspectives that encompass diverse variables in the education system. In tandem, efforts are also needed on-the-ground in terms of increasing intrinsic motivation and engagement with physical activity and sports in other domains beyond school. The need for such systemic changes has been an evident concern across various countries such as Portugal, but also others like Canada (Ministry of Education, 2007; Silva, Marques, Mata, & Rosa, 2016; Statistics Canada, 2014).

Findings showed that students generally had a moderately positive attitude toward PE. Research has shown that positive attitudes toward PE are associated with positive social interactions, fun, autonomy and movement-play (Piéron, 2005). The findings

confirmed that students' positive attitudes toward PE decreased throughout high school, especially in the nineth grade, which is supported by previous studies (e.g., Mercier et al., 2017; Evangelou & Digelidis, 2018; Marttinen et al., 2018).

Nonetheless, this is concerning and may pave the way for constructive critique and discussion towards the current status quo, which may identify the reasons for the decrease in positive attitudes toward PE. Thus, some factors may hold explanatory power and contribute to such a discussion: (a) the curriculum lacks meaningful content that challenges and motivates students (Carlson, 1995; Subramaniam & Silverman, 2007); (b) the lack of curriculum ownership (Carlson, 1995; Subramaniam & Silverman, 2007); and (c) the lack of value provided to PE (Marttinen et al., 2018; Orlić et al., 2018). The findings also support the fact that the motivational climate in PE influences participation in extracurricular sports, which is a desired outcome of PE programming (Belton et al., 2017; De Meester et al., 2017). The creation of a mastery-oriented climate is an effective strategy to increase students' motivation and can also help attain this outcome (Baena-Extremera et al., 2015; Cid et al., 2019).

Findings showcase that mastery-oriented climates have a significant influence on students' attitudes towards physical education, which also positively influenced intrinsic motivation towards participation in community youth sport programs, which is supported by previous studies (Farias et al., 2019; Säfvenbom et al., 2014; Wallhead et al., 2014). Collaborative efforts to design physical education and community youth sport programs that include policymakers, administrators, as well as teachers and coaches may need be needed. Overemphasizing competition or competitive activities may induce the creation of negative climates with consequences for student engagement and PA levels now and in the future (Escriva-Boulley et al., 2018; Moreno-Murcia et al., 2018).

In sum, the present thesis can help prompt meaningful discussions around quality PE programming, particularly regarding the role played by the educational system and teachers as interconnected variables. Without such an understanding, responsibilities will continue to be allocated unevenly and without careful consideration for how agency is distributed. Hopefully, this thesis can represent a meaningful contribution in this direction and contribute to better students' experiences. In light of the findings of the present study, efforts may be needed towards creating mastery-oriented climates that can: (a) induce positive attitudes towards physical education; (b) help students become intrinsically motivated towards PES and sustain such motivation; (c) facilitate engagement in community youth sport programs.

Finally, it is essential to mention that PE teachers should not only promote the development of motor skills but also enhance a set of socio-cognitive variables such as the perception of a mastery-oriented motivational climate and a favorable attitude towards PE. In fact, these variables are associated both with greater effectiveness in learning and academic performance in PE, and with greater participation in extracurricular physical and sports activities, as well as the adoption of healthy lifestyles. Hence, it is important that PE teachers promote learning environments characterized by a mastery-oriented motivational climate using strategies such as promoting students' intrinsic motivation; not overemphasizing competition or competitive activities; encouraging students' progress; reinforcing students' task orientation; creating learning situations where effort and helping colleagues are rewarded, and students feel they have a role to play (Digelidis et al., 2003; Escriva-Boulley et al., 2018; Fernandez-Rio et al., 2014; Moreno-Murcia et al., 2018). In tandem, PE teachers can play an important role in promoting positive attitudes towards PE by using appropriate pedagogical strategies, curriculum, instructional models, and teaching styles (Digelidis et al., 2003; Subramaniam & Silverman, 2000; Zeng et al., 2011).

Chapter 5. Conclusions

The main result of this study highlighted the importance of a motivational climate geared towards mastery and attitudes towards PE as positive predictors of the reasons for engaging in extracurricular physical and sports activities. Conversely, findings highlight that a performance-oriented climate is a predictor of extrinsic motivation and amotivation. In addition to these results, the following conclusions of this study are worth highlighting:

1. All students have a moderately positive attitude towards PE.

2. Students' positive attitudes towards PE decrease throughout their schooling, especially in the 9th grade.

3. Female students, compared to male students, have a more favorable overall attitude towards PE.

4. Students' socioeconomic status does not influence their attitudes towards PE.

5. Students who participate in extracurricular sports activities have a more positive attitude towards PE than those who do not.

6. Students with a more favorable attitude towards PE obtain better grades in this discipline.

7. Students tend to perceive their PE classes as more mastery-oriented than performance-oriented.

8. The perception of the motivational climate in PE varies according to the students' level of education and socioeconomic status, with 7th graders tending to see their PE classes as more performance-oriented than 9th graders, and middle-class students having a more mastery-oriented perception than lower-class students.

9. A mastery-oriented climate in PE is a positive predictor of students' academic performance in this subject.

10. The Portuguese versions of the SAtPE, EPCM and SMS II show good psychometric validity and reliability for assessing students' attitudes towards PE and the motivational climate in secondary schools, as well as the reasons for practicing extracurricular sports.

Chapter 6. Future Research Directions

Based on the findings, there are several future research directions that can be explored moving forward:

(a) developing instruments and measures that assess motivational climate and students' attitudes towards PE may allow more rigorous studies to be conducted across age groups, grades, and socio-cultural contexts;
(b) developing alternative models and approaches that view attitudes towards PE and motivational climates as outcomes may increase researchers' understanding concerning quality PE programming;
(c) conducting studies that involve longitudinal process–product designs wherein the relationship between curriculum, teacher education, teaching practice, among other context variables, and students' attitudes and motivational climates can be explored;
(d) engaging in an analysis focused on how and why teachers foster a specific motivational climate and its associated with students' attitudes towards PE is needed;
(e) conducting an outcome evaluation of teacher education programs through motivational climate and students' attitudes toward PE may be necessary to inform future educational reforms and research priorities;
(f) mapping participation in extracurricular sports and students' PA levels and its relationship with motivational climates.

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