European Journal of Physical Education and Sport Science
ISSN: 2501 - 1235
ISSN-L: 2501 - 1235
Available on-line at: www.oapub.org/edu

DOI: 10.46827/ejpe.v11i3.5468 Volume 11 | Issue 3 | 2024

THE ASSOCIATION OF SELF-CONCEPT AND MOTIVATIONAL CLIMATE WITH COGNITIVE AND EMOTIONAL RESPONSES IN PHYSICAL EDUCATION

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Abstract:
The primary objective of this study was to investigate the association between self-concept, motivational climate, amotivation, enjoyment and vitality in physical education lessons. The study's sample comprised 313 students, including 158 males and 155 females, with a mean age of 13.9 years (SD = 87). Students were selected from three public schools within the Regional Authority of Secondary Education of Western Macedonia. Participants completed a survey including measures of self-concept, motivational climate, amotivation, enjoyment and vitality. The results of the analysis revealed that self-concept and motivational climate were positively associated with enjoyment and vitality and negatively with amotivation. Motivational climate fully mediated the effect of self-concept on enjoyment and amotivation, and partially the effect of self-concept on vitality. The findings of the study show that autonomous supportive climate in physical education lessons can be an effective practice in establishing positive experiences in the physical education lesson.

Keywords: self-concept, amotivation, theory of self-determination, physical education

1. Introduction

Self-concept has a significant impact on emotional growth and contributes to increased self-esteem. It is a manifestation of an individual's mental perception of their own personal appearance or a structured framework of self-awareness that subsequently influences a person's social conduct (Lawendowski & Bieleninik, 2017). In addition, motivation plays a major role in physical education as it defines the students' drive to

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participate in the lesson. Existing evidence has highlighted the notable physical and psychological benefits of youth participating in physical activity (Gao & Xiang, 2014; Goñi & Rodríguez, 2007; Goodway *et al.*, 2014). Engaging in physical activity has a favorable association with one's perception of their physical self (Esnaola & Zulaika, 2009; Grao-Cruces *et al.*, 2014; Reigal Garrido *et al.*, 2012). Studies suggest that children are more likely to engage in physical activities when they have a positive perception of their own competence (Atkins *et al.*, 2015). Physical education represents a safe and non-competitive environment where children can participate in physical activity and develop their cognitive and emotional selves (Opstoel *et al.*, 2020). Nevertheless, several features of the physical education lesson can either promote or hinder physical activity participation (Ryan & Deci, 2020). Students' perceptions of teacher-initiated climate are considered an essential feature of the physical education lesson that defines the motivational process and the outcomes from participation in the lesson. In this study, we explore the associations of self-concept with students' responses in the physical education lesson and the potential mediating effect of perceptions of teacher-initiated motivational climate.

2. Perceptions of motivational climate in physical education

The structure of the learning environment, i.e., motivational climate, influences motivation (Ryan & Deci, 2020) and is associated with students' self-concept (Expósito-López *et al.*, 2023). According to Banerjee and Halder (2021), there are salient features of the teacher-initiated motivational climate in physical education that can significantly impact students' academic performance as well as cognitive, emotional and behavioral responses (see also Vallerand, 2007). The autonomous supportive motivational climate in physical education has been found to significantly influence students' amotivation (Vasconcellos *et al.*, 2020), enjoyment (Jaakkola *et al.*, 2017; Johnson *et al.*, 2017; Liukkonen *et al.*, 2010), and vitality (Gerani *et al.*, 2020; Mouratidis *et al.*, 2011). In particular, studies have shown that autonomous supporting motivational climates in physical education can help to reduce amotivation. For example, a study found that students who perceived their physical education teachers to be more autonomous supportive showed less amotivation as compared to those promoting social comparison (García-González *et al.*, 2019). Another study found that students endorsing an autonomous supportive climate in physical education lessons reported negative association with amotivation, whereas those endorsing a more controlling climate had a positive association with amotivation (Haerens *et al.*, 2015). Similarly, autonomous supportive motivational climates in physical education have been shown to increase student enjoyment. Indicatively, Gil-Arias *et al.* (2020) found that students who perceived their physical education teachers to be more autonomy supportive reported higher levels of enjoyment. In addition, Jaakkola *et al.* (2019) indicated that students focusing on personal improvement reported higher levels of enjoyment than those who participated in lessons with a more controlling climate providing emphasis on social

comparison. Moreover, autonomous supportive motivational climates in physical education have been shown to increase student vitality. The findings of the Gucciardi *et al.* (2019) study indicated that students who perceived greater amounts of need-supportive behaviors from their tutor demonstrated higher levels of behavioral engagement, and vitality. In this line, Mouratidis *et al.* (2011) argued that autonomous supportive climate results in high levels of students' vitality.

2.1 Self-concept in physical education

Alsaker and Kroger (2020) defined self-concept as a person's self-perceptions created via experience with and interpretations of his/her environment. They suggested that self-concept is shaped by significant people' opinions, reinforcement, and action attributions. Self-perceptions affect behavior, which in turn affects self-perception (Marsh *et al.*, 2019). Self-concept is characterized by its multifaceted nature and hierarchical organization. At the foundation of this hierarchy are individuals' perceptions of their own behavior in specific situations. Moving up the hierarchy, individuals form inferences about themselves in broader domains such as social, physical, and academic contexts. Finally, at the highest level of the hierarchy, individuals develop a global self-concept (Marsh & Martin, 2011). According to Liu and Yu (2019), self-concept helps determine adolescents' performance in physical education. Self-concept displays a person's abilities in organizing and carrying out different courses of action that are required to generate specific achievements. Hortigüela-Alcalá *et al.* (2016) indicated that the interplay of self-concept with motivational climate can influence students' responses in the physical education lesson. In this line, Simms *et al.* (2014) argued that participation in physical education lessons may have a positive effect on self-concept. Similarly Fernández-Río *et al.* (2013) indicated that the content of the lesson and the type of instruction can influence students' self-concept. Nevertheless, there is no evidence on how perceptions of the self influence students' perceptions and participation in the lesson.

2.2 Students' responses in physical education

School-based physical education lessons have been associated with positive outcomes among pupils, including competence, fun during classes and leisure time, better academic performance, and the development of social skills (Kokkonen *et al.*, 2019). This is because physical education offers a context where the pupils can engage in sporting activities authentically and gain relevant experience. It also serves as a way of promoting physical exercise to pupils, especially those who get limited time for exercise outside school (Kohl III & Cook, 2013). Evidence-based physical education programs indicate that physical education classes in schools provide positive motivational and affective experiences in students' later engagement in physical activities (Opstoel *et al.*, 2020). The studies also indicate that there is a decline in motivation toward physical education among students in secondary education (Barkoukis *et al.*, 2010; Ntoumanis *et al.*, 2009). Recent research has centered on the significance of emotions in determining

the intention to engage in physical education and physical activity (Fierro-Suero *et al.*, 2022). Students participate in school physical activities and sporting events because of the sheer enjoyment, fun, and emotional feelings they experience when they interact with peers (Morrison, 2012). Fueling desires bear the concept of vitality among students for them to engage in the lesson for pleasure and satisfaction.

On the other hand, amotivation is a rather understudied construct in the physical education context as research on motivation has been largely focused on intrinsic/autonomous and extrinsic/controlled motivation (Vasconcellos *et al.*, 2020). Amotivation in physical education is a significant concern, impacting students' engagement and participation. Research indicates that amotivation stems from a lack of autonomy supportive climates, which is a crucial component of Self-Determination Theory (Deci & Ryan, 2000). For instance, Leyton-Román *et al.* (2020) and Jackson-Kersey and Spray (2013) found that students experiencing a controlling climate reported higher amotivation in physical education classes. Similarly, Cheon *et al.* (2016) highlighted that an autonomy-supportive climate intervention can have a positive effects on students' amotivation. Moreover, Jackson-Kersey and Spray (2013) demonstrated that amotivation is negatively associated with students' self-concept. These findings suggest that physical education motivational climate and self-concept are associated with students' perceptions of amotivation and their overall participation and enjoyment in physical education lessons.

2.3 The present study

A student's perception of self-concept often determines the desire to attempt new things and keep engaging in physical activity. Students are more likely to develop unfavorable attitudes toward physical education lessons and be less interested in participating in them in the future when they do not have a chance to acquire, practice, and become competent in using motor skills. Importantly, many students formulate their perceptions of physical self from extracurricular activities, e.g. participation in a sport club. In this case, the perception of self-concept may influence their perceptions about the teacher-initiated motivational climate and, subsequently, their experiences from participating in the physical education lesson. However, in the existing literature, self-concept has been viewed as the outcome of the participation in physical education (Fernández-Río *et al.*, 2013; Hortigüela-Alcalá *et al.*, 2016; Simms *et al.*, 2014). Moreover, as Marsh *et al.* (2019) noted, behavior influences self-concept and vice versa. Furthermore, in the context of physical education, there is no evidence on how students' pre-established self-concept (e.g., through previous experiences in physical education and sport settings) can influence motivational and affective experiences in the lesson. To address this gap, the purpose of this research was to examine the relationships between self-concept, motivational climate, amotivation, and emotions during students' participation in the physical education lesson. More specifically, the aim of the study was to investigate whether students' self-concept influences cognitive and emotional responses during the physical education lesson with an emphasis on amotivation,

enjoyment and vitality and the potential mediating role of perceptions of motivational climate. Based on the existing literature, we hypothesized that a) self-concept will be positively associated with enjoyment and vitality and negatively with amotivation (H1), b) perceptions of autonomy supportive motivational climate will be positively associated with students' enjoyment and vitality and negatively with amotivation (H2), and c) autonomy supportive motivational climate will mediate the association between self-concept and students' amotivation, enjoyment and vitality (H3).

3. Method

3.1 Sample

The current study involved a total of 313 children, consisting of 158 boys and 155 girls. These students were selected from three public schools under the Directorate of Secondary Education of Western Macedonia, Greece. The participants were enrolled in grades 1, 2, and 3 of junior high school. The mean age of the students was 13.9 years (SD = .87). Participant recruitment was conducted using convenience sampling, where the school was the unit of selection. Schools were selected based on their availability and accessibility. This approach was chosen to expedite the data collection process and ensure a sufficient sample size.

3.2 Measures

3.2.1 Motivational climate in Physical Education

Perceptions of motivational climate in Physical Education were measured via the Perceived Autonomy Support Scale for Exercise Settings (PASSES; Hagger *et al.*, 2007). This scale measures students' perception of teacher-initiated autonomy-supportive climate. The scale consists of 15 questions (e.g., I think my teacher gives me choices and opportunities). Students responded on a 7-point Likert scale (1- strongly disagree to 7- strongly agree).

3.2.2 Amotivation

A scale developed for this study was used to assess amotivation, the Display of Amotivation in the Physical Education scale. The scale was based on the themes and subthemes of amotivation identified by Ntoumanis *et al.* (2004) that were reworded to express behaviors of amotivated in physical education classes students. A pool of 22 items was created and was subjected to an exploratory factor analysis. The results of the analysis indicated that seven items had high loadings in two factors. Thus, these items were excluded from further analysis. The final scale comprised 15 items measuring three dimensions; a) avoidance behavior (e.g., I usually try to avoid class), b) low participation (e.g., I usually get bored), and c) low intention to participate in future physical activities (e.g., I'm glad to be out of class and I will not participate in physical activity when I finish school). Responses were anchored on a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree).

3.2.3 Self-concept

The Physical Self-Description Questionnaire (PSDQ; Marsh, 1996) was used to assess self-concept. The PSDQ is a questionnaire comprising 70 questions developed to measure 11 specific components of physical self-perception: namely strength, body fat, activity, endurance/fitness, sport competence, coordination, health, appearance, flexibility, global physical self-worth, and global self-esteem. In the context of applied research, the PSDQ is frequently seen as excessively time-consuming to administer when utilized in conjunction with other measures or inventories (Marsh *et al.*, 2010). In the present study we used 27 questions reflecting coordination (2 items, e.g., I feel confident when doing coordinated movements), physical activity (3 items, e.g., I do sports, exercise, dance, or other physical activities almost everyday), appearance (4 items, e.g., I am attractive for my age), body fat (4 items, e.g., I am overweight), sports competence (3 items, e.g., Other people think that I am good at sports), global physical self-concept (2 items, e.g., Physically, I am happy with myself), strength (2 items, e.g., I am a physically strong person), flexibility (3 items, e.g., My body is flexible), endurance (1 item, e.g., I think I could run a long way without getting tired), and esteem (3 items, e.g., Most things I do, I do well). All items has indicated high factor loadings in previous validation of the scale in Greece (Zahariadis *et al.*, 2005). Students' responses were provided on a 6-point Likert scale ranging from 1 (false) to 6 (true). A composite score describing physical self-description was used in all analyses.

3.2.4 Interest – Enjoyment

The respective subscale of the Intrinsic Motivation Inventory (IMI), developed by McAuley *et al.* (1989) was used. The Interest-Enjoyment sub-scale is composed of four items, e.g., 'I enjoy the physical education lesson very much.' Responses were anchored on a 5-point Likert-type scale ranging from 1 (indicating a strong disagreement) to 5 (indicating a strong agreement).

3.2.5 Vitality

The present study employed the Subjective Vitality Scale, a 7-item questionnaire developed by Ryan and Frederick (1997), to assess individuals' subjective perception of vitality and liveliness. The prompt provided in the questionnaire instructed participants to indicate the extent to which they believed each item (e.g., 'I feel I have a lot of energy') to be generally true for themselves. Participants responded on a 7-point Likert scale with 1 indicating the response is not at all true and 7 indicating the response is very true.

3.2.6 Procedure

Permission was obtained from the director of secondary education and the teachers' working in the schools. In adherence to the Code of Ethics in Research of the Aristotle University of Thessaloniki, we implemented a rigorous procedure to ensure the anonymity and confidentiality of participants' responses. Inform consent to participate

in the study was obtained from both parents and students. Prior to data collection, no personally identifiable information was collected. Survey completion took place in a quiet classroom with the supervision of the researchers. The physical education teacher was absent in order to avoid social desirability biases. Survey completion lasted approximately 20 minutes. Participants were provided with written and oral instruction about the survey items. The researcher supervising data collection was available for further clarifications. Participants were assured that their individual responses would be kept strictly confidential and used solely for research purposes. Additionally, any information that could potentially identify participants was carefully removed or anonymized during data analysis.

3.3 Statistical analysis

The data underwent statistical analysis using the Statistical Package for Social Sciences (SPSS v.28) and MPlus 8.10. A descriptive analysis was performed on the data, and a reliability analysis was conducted on the scales using Cronbach's alpha coefficient. With respect to the development of the scale, first, we conducted an exploratory factor analysis (EFA) to examine its underlying factor structure. The principal component analysis with varimax rotation was employed to extract factors, and the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Bartlett's test of sphericity were examined to ensure the appropriateness of the data for factor analysis. Following the EFA, a confirmatory factor analysis (CFA) was performed to validate the factor structure identified in the exploratory phase. In order to assess the adequacy of the model, we conducted an analysis of incremental and absolute fit indices. These indices included the χ^2 statistic, comparative fit index (CFI), Tucker-Lewis Index (TLI or non-normed fit index), root mean square error of approximation (RMSEA), and standardized root mean square residual (SRMR). The criteria that were considered indicative of good model fit included a Comparative Fit Index (CFI) greater than 0.90, a Tucker-Lewis Index (TLI) greater than 0.90, a Root Mean Square Error of Approximation (RMSEA) less than 0.06, and a Standardized Root Mean Square Residual (SRMR) less than 0.06 (Marsh *et al.*, 2004). The model was considered to have obtained an acceptable fit if it satisfied all of the specified criteria. In order to evaluate the association among the variables, linear regression analysis was undertaken. To examine the multiple mediation in hypothesis 4, the Hayes multiple mediation approach was used with PROCESS v4.2 for SPSS (Hayes, 2017). This approach allows for the simultaneous testing of multiple mediators, as well as the indirect effects of the independent variable on the dependent variable through each mediator.

4. Results

4.1 Factorial validity of the amotivation scale

The quality of the fit was evaluated using several metrics. The Comparative Fit Index (CFI) was 0.95, which is considered an excellent fit for the data. The Tucker-Lewis Index

(TLI) was 0.94, which also suggests a good fit. The standardized root mean square residual (SRMR) was 0.055, and the Root mean square error of approximation (RMSEA) was 0.057 (90% CI = 0.044-0.069), which further supports the model fit. Additionally, the standardized factor loadings were all significant, and they were above 0.660 for *Avoidance behavior*, 0.752 for *Low involvement*, and from 0.403 for *Low intention to participate in future physical activities*. Interfactor correlations were significant, supporting the convergent validity of the model.

4.2 Descriptive statistics

The means, standard deviations, and internal consistency coefficients of the study variables are shown in Table 1. The results of the correlation analysis revealed moderate associations among the variables (Table 1). Due to the high correlations among the amotivation subscales a composite score was used in subsequent analyses describing a unifying construct of amotivation in physical education lessons.

4.2.1 Associations of self-concept and motivational climate with the dependent variables

With respect to self-concept, the results of the regression analysis indicated that it is positively associated with enjoyment (R^2 = .03, F = 12.05, p > .001, b = .19, p < .001), and vitality (R^2 = .18, F = 68.63, p > .001, b = .42, p < .001), and negatively with amotivation (R^2 = .03, F = 11.28, p > .001, b = -.18, p < .001).

The results of the regression analysis indicated that autonomy supportive climate is positively associated with enjoyment (R^2 = .19, F = 77.16, p > .001, b = .44, p < .001), and vitality (R^2 = .09, F = 32.91, p > .001, b = .30, p < .001), whereas it was negatively associated with amotivation (R^2 = .14, F = 53.94, p > .001, b = -.38, p < .001).

4.2.2 Association of self-concept and motivational climate with cognitive and emotional responses

The results of the mediation analysis using the PROCESS 4.2 macro by Hayes (2017) indicated a significant mediation effect of motivational climate in the relationship between self-concept and amotivation, enjoyment, and vitality (Figure 1). The total effects of self-concept on amotivation, enjoyment and vitality were found to be β = -0.39, p < 0.001, β = 0.60, p < 0.001, β = 1.16, p < 0.001, respectively. The direct effects of self-concept on amotivation enjoyment, and vitality was β = -0.14, p = .2098, β = 0.16, p = .3155, and β = 0.99, p < 0.001, respectively. The indirect effects of self-concept on amotivation, enjoyment, and vitality through motivational climate was β = -0.24, (-.3817, -.1384), β = 0.43 (.2534, .6365) and β = 0.17 (.0667, .3101) respectively, and was significant in all cases. The non-significant direct effects and the significant indirect effects indicate full mediation of motivational climate to the effect of self-concept on amotivation and enjoyment, whereas the significant direct and indirect effects on the analysis of vitality indicate a partial mediation (Table 2).

5. Discussion

The present study was designed to investigate the association of self-concept with cognitive and emotional responses in physical education lessons and the mediating role of motivational climate. The results of the regression analyses reveal significant associations between self-concept and the dependent variables, shedding light on the intricate relationship between individuals' self-perceptions and their motivational and emotional experiences in the context under study. Specifically, higher levels of self-concept were positively associated with increased enjoyment and vitality, while demonstrating a negative association with amotivation. The results of the study confirmed the positive association of self-concept with enjoyment and vitality and the negative association with amotivation. The regression analyses also provide insights into the impact of an autonomy-supportive climate on individuals' experiences. An autonomy-supportive climate was found to be positively associated with both enjoyment and vitality, while demonstrating a negative association with amotivation. Furthermore, a significant mediation effect was observed, suggesting that motivational climate serves as an important mediator in the relationship between self-concept and amotivation, enjoyment, and vitality.

Our first hypothesis proposed that self-concept would be positively associated with enjoyment and vitality and negatively associated with amotivation. The results of the regression analysis supported this hypothesis. The positive association between self-concept and enjoyment implies that individuals with a more positive self-concept are likely to derive greater enjoyment from the physical education lesson. Previous evidence revealed positive associations between motor self-efficacy and physical self-concept with enjoyment/satisfaction in physical education (Morales-Sánchez *et al.*, 2021), suggesting that students who have a positive self-concept and believe in their abilities to perform physical activities are more likely to enjoy physical education lessons and participate actively in them. Our finding aligns also with previous research suggesting that a positive self-concept serves as a motivational factor, influencing the overall experience and engagement in physical education (Lohbeck *et al.*, 2021). The finding linking self-concept to vitality further reinforces the notion that one's perception of oneself plays a crucial role in shaping the vigor and energy individuals bring to their pursuits. Previous evidence indicated that a positive self-concept can lead to increased vitality in physical education (Fernández-Bustos *et al.*, 2019). This evidence suggests that students who have a positive self-concept and believe in their abilities to perform physical activities are more likely to feel vital and energetic during physical education lessons. Conversely, the negative association with amotivation suggests that individuals with lower self-concept may be more prone to experiencing a lack of motivation, emphasizing the importance of bolstering self-perceptions to foster engagement and commitment. This is in line with previous research reporting that a negative self-concept can lead to increased amotivation in physical education (Jackson-Kersey & Spray, 2013). Our findings demonstrate that students who have a negative self-concept

and do not believe in their abilities to perform physical activities are more likely to feel amotivated during physical education lessons.

Our second hypothesis suggested that perceptions of the physical education motivational climate would be positively associated with students' enjoyment and vitality and negatively associated with amotivation. The results supported this hypothesis, indicating that an autonomy-supportive climate is positively associated with enjoyment and vitality and negatively associated with amotivation. The positive association between autonomy-supportive climate and enjoyment is in line with self-determination theory, suggesting that creating an environment that nurtures individuals' autonomy and self-expression contributes significantly to enhancing the positive experiences, fostering a sense of energy and reducing feelings of aimlessness and disengagement associated with school physical education (Ryan *et al.*, 2022; Ryan & Deci, 2020). These findings highlight the influential role of the environment in shaping individuals' motivational and emotional states in physical education lessons and support the development of an autonomous supportive motivational climate (Barkoukis *et al.*, 2021).

The results of the mediation analysis indicated significant mediation effects, suggesting that motivational climate serves as a crucial mediator in the relationship between self-concept and amotivation, enjoyment, and vitality. The full mediation observed for amotivation and enjoyment implies that the impact of self-concept on these variables is entirely explained by the influence of motivational climate. This underscores the importance of the surrounding climate in determining how individuals with varying self-concepts interpret and engage with the physical education lesson (Barkoukis *et al.*, 2021; Ryan *et al.*, 2022; Ryan & Deci, 2020). More specifically, an autonomous supportive climate that provides the rationale behind activities and rules, adopting a questioning approach instead of simply instructing students what to do, assisting students when encountering problems to solve problems on their own, endorsing active listening of students' ideas and concerns, providing positive feedback and avoiding controlling language, assists students with high self-concept to demonstrate lower levels of maladaptive motivation (i.e., amotivation) and increased positive experiences from the lesson (i.e., enjoyment). On the other hand, the partial mediation observed for vitality suggests that while motivational climate plays a significant role, self-concept still maintains a significant role in forming vitality, and perhaps there are additional factors contributing to this relationship. These finding further supports the strong association between self-concept and vitality reported in the literature (Fernández-Bustos *et al.*, 2019) and signifies an important path in the experience of vitality in the lesson. In this case, higher levels of physical self-concept work along the features of autonomous supportive motivational climate in making students feel energetic and alive.

The study is not free of limitations. The convenience sample from one educational region does not allow generalization of the results and future studies should include larger samples from more diverse regions. In addition, as motivational

climate was measured it is possible that students responded in a socially desirable way, although the physical education teacher was not present during survey completion. Observation of the lesson could provide objective indicators of the teacher-initiated climate, and future studies would benefit from triangulating students' responses. Despite these limitations, these findings contribute to our understanding of the intricate interplay between self-concept, motivational climate, and cognitive and emotional responses. They underscore the importance of fostering positive self-perceptions and creating autonomy-supportive environments to promote enjoyment, vitality, and reduce amotivation in the context under study. Further research could explore additional factors influencing these relationships and potential interventions to enhance the overall well-being and engagement of individuals in similar settings. Future research could further investigate the mechanisms underlying these relationships and explore potential interventions to enhance self-concept and create a supportive, motivational climate in physical education. Additionally, future studies could examine these relationships in different educational contexts and among different student populations to enhance the generalizability of the findings. In conclusion, this study contributes to our understanding of the relationships between self-concept, motivational climate, and students' cognitive and emotional responses in physical education. The findings highlight the importance of self-concept and the motivational climate in shaping students' experiences in physical education and provide valuable insights for educational practice.

Conflict of Interest Statement

The authors declare no conflicts of interest.

References

Alsaker, F. D., & Kroger, J. (2020). Self-concept, self-esteem, and identity. In *Handbook of adolescent development* (pp. 90–117). Psychology Press.

Atkins, M. R., Johnson, D. M., Force, E. C., & Petrie, T. A. (2015). Peers, parents, and coaches, oh my! The relation of the motivational climate to boys' intention to continue in sport. *Psychology of Sport and Exercise*, *16*, 170–180.

Banerjee, R., & Halder, S. (2021). Amotivation and influence of teacher support dimensions: A self-determination theory approach. *Heliyon*, *7*(7).

Barkoukis, V., Chatzisarantis, N., & Hagger, M. S. (2021). Effects of a school-based intervention on motivation for out-of-school physical activity participation. *Research Quarterly for Exercise and Sport*, *92*(3), 477–491.

Barkoukis, V., Hagger, M. S., Lambropoulos, G., & Tsorbatzoudis, H. (2010). Extending the trans-contextual model in physical education and leisure-time contexts: Examining the role of basic psychological need satisfaction. *British Journal of Educational Psychology*, *80*(4), 647–670.

Cheon, S. H., Reeve, J., & Song, Y.-G. (2016). A Teacher-Focused Intervention to Decrease PE Students' Amotivation by Increasing Need Satisfaction and Decreasing Need Frustration. *Journal of Sport and Exercise Psychology*, *38*(3), 217–235. https://doi.org/10.1123/jsep.2015-0236

Esnaola, I., & Zulaika, L. M. (2009). Physical activity and physical self-concept in a sample of middle-age Basque adults. *Perceptual and Motor Skills*, *108*(2), 479–490.

Expósito-López, J., Parejo-Jiménez, N., Olmedo-Moreno, E. M., & Chacón-Cuberos, R. (2023). Type of school and origin as conditioners of motivational development in post-compulsory secondary education. *Cogent Education*, *10*(1), 2188800.

Fernández-Bustos, J. G., Infantes-Paniagua, Á., Cuevas, R., & Contreras, O. R. (2019). Effect of physical activity on self-concept: Theoretical model on the mediation of body image and physical self-concept in adolescents. *Frontiers in Psychology*, *10*, 1537.

Fernández-Río, J., Méndez-Giménez, A., & Méndez-Alonso, D. (2013). Effects of three instructional approaches in adolescents' physical self-concept. *Cultura y Educación*, *25*(4), 509–521.

Fierro-Suero, S., Sáenz-López, P., Carmona-Márquez, J., & Almagro, B. J. (2022). Achievement emotions, intention to be physically active, and academic achievement in physical education: Gender differences. *Journal of Teaching in Physical Education*, *42*(1), 114–122.

Gao, Z., & Xiang, P. (2014). Effects of exergaming based exercise on urban children's physical activity participation and body composition. *Journal of Physical Activity and Health*, *11*(5), 992–998.

García-González, L., Sevil-Serrano, J., Abós, A., Aelterman, N., & Haerens, L. (2019). The role of task and ego-oriented climate in explaining students' bright and dark motivational experiences in Physical Education. *Physical Education and Sport Pedagogy*, *24*(4), 344–358.

Gerani, C., Theodosiou, A., Barkoukis, V., Papacharisis, V., Tsorbatzoudis, H., & Gioupsani, A. (2020). The effect of a goal-setting program in physical education on cognitive and affective outcomes of the lesson. *Physical Educator*, *77*(2), 332–356.

Gil-Arias, A., Claver, F., Práxedes, A., Villar, F. D., & Harvey, S. (2020). Autonomy support, motivational climate, enjoyment and perceived competence in physical education: Impact of a hybrid teaching games for understanding/sport education unit. *European Physical Education Review*, *26*(1), 36–53.

Goñi, A., & Rodríguez, A. (2007). Variables associated with the risk of eating disorders in adolescence. *Salud Mental*, *30*(4), 16–23.

Goodway, J. D., Stodden, D., Lomax, R., Brian, A. S., Chang, S. H., & Famelia, R. (2014). Relationships between motor competence and physical activity change across childhood. *Research Quarterly for Exercise and Sport*, *85*(S1), A14.

Grao-Cruces, A., Fernández-Martínez, A., & Nuviala, A. (2014). Association of fitness with life satisfaction, health risk behaviors, and adherence to the Mediterranean

diet in Spanish adolescents. *The Journal of Strength & Conditioning Research*, *28*(8), 2164–2172.

Gucciardi, D. F., Weixian, J. C., Gibson, W., Ntoumanis, N., & Ng, L. (2019). Motivational Climate in the Classroom. *European Journal of Psychological Assessment*.

Haerens, L., Aelterman, N., Vansteenkiste, M., Soenens, B., & Van Petegem, S. (2015). Do perceived autonomy-supportive and controlling teaching relate to physical education students' motivational experiences through unique pathways? Distinguishing between the bright and dark side of motivation. *Psychology of Sport and Exercise*, *16*, 26–36.

Hagger, M. S., Chatzisarantis, N. L., Hein, V., Pihu, M., Soos, I., & Karsai, I. (2007). The perceived autonomy support scale for exercise settings (PASSES): Development, validity, and cross-cultural invariance in young people. *Psychology of Sport and Exercise*, *8*(5), 632–653.

Hayes, A. F. (2017). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. Guilford publications.

Hortigüela-Alcalá, D., Pérez-Pueyo, A., & Calderón-Luquín, A. (2016). Effect of the pedagogical model on the physical self-concept of students in physical education. *Retos*, *30*, 76–81.

Jaakkola, T., Barkoukis, V., Huhtiniemi, M., Salin, K., Seppälä, S., Lahti, J., & Watt, A. (2019). Enjoyment and anxiety in Finnish physical education: Achievement goals and self-determination perspectives. *Journal of Physical Education and Sport*, *19*(3).

Jaakkola, T., Yli-Piipari, S., Barkoukis, V., & Liukkonen, J. (2017). Relationships among perceived motivational climate, motivational regulations, enjoyment, and PA participation among Finnish physical education students. *International Journal of Sport and Exercise Psychology*, *15*(3), 273–290.

Jackson-Kersey, R., & Spray, C. (2013). Amotivation in physical education: Relationships with physical self-concept and teacher ratings of attainment. *European Physical Education Review*, *19*(3), 289–301.

Johnson, C. E., Erwin, H. E., Kipp, L., & Beighle, A. (2017). Student perceived motivational climate, enjoyment, and physical activity in middle school physical education. *Journal of Teaching in Physical Education*, *36*(4), 398–408.

Kohl III, H. W., & Cook, H. D. (2013). *Educating the student body: Taking physical activity and physical education to school*.

Kokkonen, J., Yli-Piipari, S., Kokkonen, M., & Quay, J. (2019). Effectiveness of a creative physical education intervention on elementary school students' leisure-time physical activity motivation and overall physical activity in Finland. *European Physical Education Review*, *25*(3), 796–815.

Lawendowski, R., & Bieleninik, Ł. (2017). Identity and self-esteem in the context of music and music therapy: A review. *Health Psychology Report*, *5*(2), 85–99.

Leyton-Román, M., González-Vélez, J. J. L., Batista, M., & Jiménez-Castuera, R. (2020). Predictive model for amotivation and discipline in physical education students based on teaching–learning styles. *Sustainability*, *13*(1), 187.

Liu, C., & Yu, C. (2019). Understanding students' motivation in translation learning: A case study from the self-concept perspective. *Asian-Pacific Journal of Second and Foreign Language Education*, *4*(1), 1–19.

Liukkonen, J., Barkoukis, V., Watt, A., & Jaakkola, T. (2010). Motivational climate and students' emotional experiences and effort in physical education. *The Journal of Educational Research*, *103*(5), 295–308.

Lohbeck, A., Von Keitz, P., Hohmann, A., & Daseking, M. (2021). Children's physical self-concept, motivation, and physical performance: Does physical self-concept or motivation play a mediating role? *Frontiers in Psychology*, *12*, 669936.

Marsh, H. W. (1996). Physical self description questionnaire: Stability and discriminant validity. *Research Quarterly for Exercise and Sport*, *67*(3), 249–264.

Marsh, H. W., Hau, K.-T., & Wen, Z. (2004). In search of golden rules: Comment on hypothesis-testing approaches to setting cutoff values for fit indexes and dangers in overgeneralizing Hu and Bentler's (1999) findings. *Structural Equation Modeling*, *11*(3), 320–341.

Marsh, H. W., Lüdtke, O., Muthén, B., Asparouhov, T., Morin, A. J., Trautwein, U., & Nagengast, B. (2010). A new look at the big five-factor structure through exploratory structural equation modeling. *Psychological Assessment*, *22*(3), 471.

Marsh, H. W., & Martin, A. J. (2011). Academic self-concept and academic achievement: Relations and causal ordering. *British Journal of Educational Psychology*, *81*(1), 59–77.

Marsh, H. W., Pekrun, R., Parker, P. D., Murayama, K., Guo, J., Dicke, T., & Arens, A. K. (2019). The murky distinction between self-concept and self-efficacy: Beware of lurking jingle-jangle fallacies. *Journal of Educational Psychology*, *111*(2), 331.

McAuley, E., Duncan, T., & Tammen, V. V. (1989). Psychometric properties of the Intrinsic Motivation Inventory in a competitive sport setting: A confirmatory factor analysis. *Research Quarterly for Exercise and Sport*, *60*(1), 48–58.

Morales-Sánchez, V., Hernández-Martos, J., Reigal, R. E., Morillo-Baro, J. P., Caballero-Cerbán, M., & Hernández-Mendo, A. (2021). Physical self-concept and motor self-efficacy are related to satisfaction/enjoyment and boredom in physical education classes. *Sustainability*, *13*(16), 8829.

Morrison, C. M. (2012). *Disability, physical education and sport: Tom talks*.

Mouratidis, A. A., Vansteenkiste, M., Sideridis, G., & Lens, W. (2011). Vitality and interest–enjoyment as a function of class-to-class variation in need-supportive teaching and pupils' autonomous motivation. *Journal of Educational Psychology*, *103*(2), 353.

Ntoumanis, N., Barkoukis, V., & Thøgersen-Ntoumani, C. (2009). Developmental trajectories of motivation in physical education: Course, demographic differences, and antecedents. *Journal of Educational Psychology*, *101*(3), 717.

Ntoumanis, N., Pensgaard, A.-M., Martin, C., & Pipe, K. (2004). An idiographic analysis of amotivation in compulsory school physical education. *Journal of Sport and Exercise Psychology*, *26*(2), 197–214.

Opstoel, K., Chapelle, L., Prins, F. J., De Meester, A., Haerens, L., van Tartwijk, J., & De Martelaer, K. (2020). Personal and social development in physical education and sports: A review study. *European Physical Education Review*, *26*(4), 797–813.

Reigal Garrido, R., Videra García, A., Parra Flores, J., & Ruiz de Mier, R. (2012). *Physical sports activity, physical self-concept and psychological wellbeing in adolescente.*

Ryan, R. M., & Deci, E. L. (2020). Intrinsic and extrinsic motivation from a self-determination theory perspective: Definitions, theory, practices, and future directions. *Contemporary Educational Psychology*, *61*, 101860.

Ryan, R. M., Duineveld, J. J., Di Domenico, S. I., Ryan, W. S., Steward, B. A., & Bradshaw, E. L. (2022). We know this much is (meta-analytically) true: A meta-review of meta-analytic findings evaluating self-determination theory. *Psychological Bulletin*, *148*(11–12), 813.

Ryan, R. M., & Frederick, C. (1997). On energy, personality, and health: Subjective vitality as a dynamic reflection of well-being. *Journal of Personality*, *65*(3), 529–565.

Simms, K., Bock, S., & Hackett, L. (2014). Do the duration and frequency of physical education predict academic achievement, self-concept, social skills, food consumption, and body mass index? *Health Education Journal*, *73*(2), 166–178.

Vallerand, R. J. (2007). Intrinsic and extrinsic motivation in sport and physical activity: A review and a look at the future. *Handbook of Sport Psychology*, 59–83.

Vasconcellos, D., Parker, P. D., Hilland, T., Cinelli, R., Owen, K. B., Kapsal, N., Lee, J., Antczak, D., Ntoumanis, N., & Ryan, R. M. (2020). Self-determination theory applied to physical education: A systematic review and meta-analysis. *Journal of Educational Psychology*, *112*(7), 1444.

Zahariadis, P. N., Tsorbatzoudis, H., & Grouios, G. (2005). The Sport Motivation Scale for children: Preliminary analysis in physical education classes. *Perceptual and Motor Skills*, *101*(1), 43–54.

Appendices

Table 1: Descriptive statistics and correlation analysis between the study's variables

Variables	**1**	**2**	**3**	**4**	**5**	**6**	**7**
1. Self-concept	1						
2. Enjoyment	.19**	1					
3. Vitality	.42**	.54**	1				
4. Motivational climate	.32**	.44**	.30**	1			
5. Avoidance	-.05	-.51**	-.36**	-.30**	1		
6. Low participation	-.15**	-.55**	-.44**	-.35**	.63**	1	
7. Low intention	-.31**	-.40**	-.51**	-.34**	.51**	.56**	1
M	3.63	4.92	5.07	5.12	2.07	3.47	2.81
SD	.49	1.54	1.30	1.09	1.27	1.36	1.16
Cronbach α	.74	.87	.86	.89	.85	.77	.65

**. Statistically significant correlation at 0.01 level (two-way).

Table 2: Summary of the mediation models

Relationship	**Total effect**	**Direct effect**	**Indirect effect**	**Confidence interval**		**t-statistic**	**Conclusion**
				Lower bound	**Upper bound**		
Self-concept - Motivational climate - Amotivation	-.39 (000)	-.14 (.2098)	-.24	-.3817	-.1384	-3.39	Full mediation
Self-concept - Motivational climate - Enjoyment	.60 (.000)	.16 (.3155)	.43	.2534	.6365	3.47	Full mediation
Self-concept - Motivational climate - Vitality	1.16 (.000)	.99 (.000)	.17	.0667	.3101	8.28	Partial mediation

Figure 1: Mediation models