



Examination of associations across transformational teacher leadership, motivational orientation, enjoyment and boredom in physical education students

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Abstract:	<p>Previous research has highlighted positive associations between teacher transformational leadership and student enjoyment in school. However, there is a dearth of evidence regarding the mediating effect that motivational orientation has on the relationships between transformational leadership and enjoyment in physical education classes. Given that an affinity for physical education fosters healthy behaviors among adolescents outside of school, this study explores the relationships between teachers' transformational leadership style and enjoyment experienced by students in physical education, examining the mediating role played by motivational orientation in these relationships. A total sample of 478 adolescents aged 13 to 18 years ($M = 14.55$; $SD = 1.11$) participated. To assess the study variables, the Transformational Teaching Questionnaire (TTQ), the Task and Ego Orientation Questionnaire (TEOSQ) and the Intrinsic Satisfaction in Sport Instrument (SSI-EF) were used. The findings from the applied structural equation model revealed a significant and positive relationship between teachers' transformational leadership style and students' perceived satisfaction, while negative relationships were observed with feelings of boredom. Additionally, positive connections were established between task orientation and enjoyment, along with negative associations with boredom. Indirect effects were also found between a transformational leadership style and both enjoyment and boredom, mediated by the variable task motivational orientation. These results underscore the importance of evaluating both students' motivational factors and their perceptions of teachers, since they may interact with each other to determine their school satisfaction. Consequently, teachers may need to modify their behavior to improve their interactions with students and increase the chances of adherence to physical activity.</p>

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3 **Examination of associations across transformational teacher leadership,**
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6 **motivational orientation, enjoyment and boredom in physical education**
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8 **students**
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Abstract

Previous research has highlighted positive associations between teacher transformational leadership and student enjoyment in school. However, there is a dearth of evidence regarding the mediating effect that motivational orientation has on the relationships between transformational leadership and enjoyment in physical education classes. Given that an affinity for physical education fosters healthy behaviors among adolescents outside of school, this study explores the relationships between teachers' transformational leadership style and enjoyment experienced by students in physical education, examining the mediating role played by motivational orientation in these relationships. A total sample of 478 adolescents aged 13 to 18 years ($M= 14.55$; $SD= 1.11$) participated. To assess the study variables, the Transformational Teaching Questionnaire (TTQ), the Task and Ego Orientation Questionnaire (TEOSQ) and the Intrinsic Satisfaction in Sport Instrument (SSI-EF) were used. The findings from the applied structural equation model revealed a significant and positive relationship between teachers' transformational leadership style and students' perceived satisfaction, while negative relationships were observed with feelings of boredom. Additionally, positive connections were established between task orientation and enjoyment, along with negative associations with boredom. Indirect effects were also found between a transformational leadership style and both enjoyment and boredom, mediated by the variable task motivational orientation. These results underscore the importance of evaluating both students' motivational factors and their perceptions of teachers, since they may interact with each other to determine their school satisfaction. Consequently, teachers may need to modify their behavior to improve their interactions with students and increase the chances of adherence to physical activity.

Keywords

Physical Activity, leadership, fun, motivational climates, lifestyle

Introduction

Physical activity (PA) and sport provide multiple health benefits, such as strengthening the immune system, reducing the risk of metabolic or cardiovascular diseases, mitigating the impact of osteoporosis, protecting against neurodegenerative diseases, enhancing cognitive functioning, fostering the social support network and improving social skills (Holmen et al., 2020; Sember et al., 2020; Thyfault and Bergouignan, 2020; Whitty et al., 2020). On the other hand, sedentary lifestyles increase physical and mental health problems, increasing the risk of mortality (Narici et al., 2021). Despite the importance of practicing PA and sports, sedentary behaviors among young populations have increased in recent years (Bull et al., 2020; Gómez et al., 2020). Therefore, it is necessary to generate strategies that encourage children and adolescents to participate in physical activities and sports.

Physical education (PE) classes in schools are a means of promoting participation in PA and sports among children and adolescents, both during school hours and beyond (Katewongsa et al., 2022; Sevil-Serrano et al., 2022). Consequently, the PE teacher plays a crucial role in driving change and acting as a leader capable of motivating students to achieve the desired learning objectives (Cervantes and Gutiérrez, 2020; Moreno, 2020). Moreover, in general terms, the development of this subject serves as a fundamental means of promoting health during these formative years (Ovcharuk et al., 2021; Stock, 2022). To increase the possibility of promoting active and healthy lifestyles among young people, PE classes should generate positive experiences during their practice (Leisterer and Gramlich, 2021). In this way, the habits generated in these contexts could extend throughout their lives (Molina-García et al., 2016). Therefore, an appropriate approach to PE by the teaching staff, which prioritizes, among other aspects, students' enjoyment and

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3 satisfaction, could encourage adherence to physical exercise, and thereby contribute to
4 the improvement and maintenance of their health (Baños et al., 2019; Yli-Piipari et al.,
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8 2009).

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10 A fundamental element that influences students' experience in PE classes and their
11 learning process is the teacher's leadership style (Minhyun et al., 2021). Indeed, teachers
12 have a significant influence on young students, particularly in terms of their motivational
13 processes and enjoyment of PE classes and can intervene substantially to enhance student
14 learning and foster their desire to participate in physical activities (Trigueros et al., 2020).

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21 Among the leadership styles, transformational leadership (Bass, 1985; Burns,
22 1978) is one of the most studied paradigms to analyze the effects of a leader's behavior
23 on their followers (Álvarez et al. 2014; Beauchamp and Morton, 2011; Molero et al.,
24 2007). The transformational leadership approach inspires and motivates followers,
25 encouraging them to innovate and create the necessary change for future success.
26 Furthermore, transformational teaching is based on four teacher behaviours: idealized
27 influence, inspirational motivation, intellectual stimulation, and individualized
28 consideration (Bass and Riggio, 2006). Idealized influence revolves around the concept
29 of a transformational teacher acting as a positive role model. Inspirational motivation
30 entails the teacher's ability to inspire students, instilling a shared vision aligning students'
31 goals with the group's goals. The teacher's ability to be attuned to the needs and goals of
32 students, to be prepared to understand their strengths and to satisfy their personal goals is
33 related to individual consideration. Finally, intellectual stimulation focuses on
34 encouraging students to use multiple perspectives to approach new and old issues (Slavich
35 and Zimbardo, 2012).

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56 Specifically applied to the context of PE classes, transformational leadership
57 adopted by teachers leads to greater student engagement in PA (Beauchamp and Morton,
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3 2011). Likewise, transformational leadership has been studied to understand and enhance
4 the effects of PE teachers and other professionals on promoting health within the school
5 context (Beauchamp et al., 2010; Morton et al., 2010). Previous research has indicated
6 that these behaviors exhibited by teachers can be an important source of adolescents'
7 enjoyment of PE class, as well as participation in health-enhancing physical activities in
8 and out of school (Beauchamp et al., 2013).
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17 A transformational leader directs the group's efforts to produce better results
18 (Moreno, 2021), achieving increases in self-efficacy (Kark et al., 2003), motivation
19 (Piccolo and Colquitt, 2006), well-being (Arnold et al., 2007) and group performance
20 (Barling et al., 1996), as well as promoting empowerment, and goal achievement (Bass,
21 1997). Therefore, a teacher with transformational leadership style adopts behaviors which
22 empower and inspire students, giving them the confidence to achieve higher levels of
23 functioning while transcending their own interests (Beauchamp et al., 2011). Bearing this
24 in mind, the development of a transformational leadership style by teachers can affect
25 group satisfaction and performance and influence several outcomes such as student
26 enjoyment or boredom, which are key to adherence to the exercise (Castillo et al., 2020).
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Motivational orientation is another significant factor that can profoundly
influence the behavior of PE students (Erturan-İlker and Demirhan, 2013). The
achievement goal theory (AGT) is one of the most relevant current frameworks that
explains the development of behavior in PA contexts (Duda and Nicholls, 1992).
According to this theory, it is considered that the practice of PA can have a task or ego
motivational orientation (Ames, 1984; Nicholls, 1989). Task oriented students compare
their level of performance with their own expectations and focus their behavior on
improving their personal skills, and their perception of competence derives from their
commitment, effort and persistence (Cid et al., 2019). Furthermore, they perceive PA as

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3 a task that would be conducive to collaborative activities with classmates (Leisterer and
4 Gramlich 2019). On the other hand, individuals with an ego motivational orientation
5 perceive their competence and ability as dependent on others and relate success to the
6 achievement of a physical skill or task (Cid et al., 2019). That is, a PE student with an
7 ego oriented motivation would constantly try to demonstrate their competence in the
8 proposed exercises, trying to stand out from the rest (Jaakkola et al., 2017). Furthermore,
9 they perceive engaging in PA as a means to obtain recognition, social status and increase
10 their popularity (Cervelló et al., 2004; Papaioannou, 1998; Parish and Treasure, 2003,
11 Standage and Treasure, 2002).

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24 In relation to the above, and specifically in the field of PE, task motivational
25 orientation would be linked to greater intrinsic motivation (Escarti and Brustad, 2000),
26 perceived competence (Tomczak et al., 2020) and interest in PE (Duda, 1995; Cervelló
27 et al., 2004). It has also been associated with positive attitudes and beliefs towards PE
28 (Erturan-İlker and Demirhan, 2013), greater intention to be physically active (Di Battista
29 et al., 2018) and more enjoyment (Jaakkola et al., 2017). In contrast, an ego motivational
30 orientation would be linked to less effort during PE and specifically, higher levels of
31 boredom (Braithwaite et al., 2011; Jaakkola et al., 2017; Papaioannou et al., 2004;
32 Roberts et al., 2007).

33 34 35 36 37 38 39 40 41 42 43 44 45 46 *Present study*

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50 Previous studies have partially examined the relationships between transformational
51 teaching, motivational orientation and enjoyment, which are the variables discussed in
52 this study. In this line, some research has focused on the association between
53 transformational teacher leadership and enjoyment/boredom (Leisterer and Gramlich
54 2021; Jaakkola et al. 2017; Malloy and Kavussanu 2021). However, to the best of our
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3 knowledge, no studies have explored the relationship between transformational
4 leadership and enjoyment/boredom while considering motivational orientation as a
5 mediator. Given the multidimensional nature of psychosocial phenomena, it is considered
6 necessary to assess this aspect in explanatory models to avoid obtaining biased results,
7 since the way students orient their PA in PE classes could condition their sense of
8 enjoyment or boredom when their teachers use a transformational leadership style (View
9 et al., 2009).

19 Furthermore, although the specific mediating effect tested in this study has not
20 been previously validated, previous research has found evidence of the mediating
21 capacity of motivational orientation among other variables. For example, its effects have
22 been observed as a mediating variable between sports participation and moral functioning
23 (Kavussanu and Ntoumanis, 2003), as well as on the relationships between engagement
24 and academic self-concept at school (Usán Supervía et al., 2020), and also between values
25 and attitudes in young athletes (Lee et al., 2008). Therefore, it has been observed in
26 previous research that motivational orientation can condition young people's self-
27 perceptions. Therefore, based on these premises, we consider it interesting to explore
28 whether motivational orientation may affect the perception of enjoyment in a school PA
29 context where leadership style is perceived in a specific way.

44 Thus, the aim of this study was to explore the relationships between the
45 transformational leadership style adopted by PE teachers and the enjoyment/boredom that
46 students experience in class, observing the mediating effects that motivational orientation
47 has on these variables.

53 We hypothesize that:

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3 (1) Students' perceptions of a transformational teaching style are positively
4 associated with enjoyment and negatively associated with student boredom in class
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6 (Malloy and Kavussanu, 2021).
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10 (2) Transformational style is positively related to task-oriented motivation and
11 negatively related to ego-oriented motivation (Jaakkola et al., 2017).
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14 (3) Task-oriented motivation is positively associated with enjoyment and
15 negatively associated with boredom.
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18 (4) Ego-oriented motivation is positively associated with boredom (Baena-
19 Extremera and Granero-Gallegos, 2014).
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22 (5) Transformational style is positively related to enjoyment, with motivational
23 orientation acting as a mediating factor in this relationship (Castillo et al., 2020).
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30 **Methods**

31 *Participants*

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34 A total sample of 478 adolescents (235 boys, 243 girls) aged between 13 and 18 (M=
35 14.55; SD= 1.11) participated in the study. They were taking the subject of PE in the
36 second to fourth years of compulsory secondary education in four schools in the province
37 of Jaén. All the schools were interested in participating in the research. PE is a
38 compulsory subject which is present in all four years of the secondary stage in the national
39 curriculum. It has a weekly teaching load of two hours and develops five subject-specific
40 competences. Among these, the first one is key, as it aims to promote the adoption of
41 healthy habits in adolescents' leisure time. In the present study, the number of students
42 per class ranged from 23 to 28. All participating students attended class regularly. The
43 exclusion criteria were: (a) not attending class regularly; (b) presenting some difficulty in
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3 reading and understanding the questions asked in the study; (c) suffering from an injury
4 which prevented them from doing PE in the previous few weeks; (d) having recently
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7 joined the school.
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10 11 *Instruments*

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15 **Transformational Teaching Questionnaire (TTQ)** (Beauchamp et al., 2010). The
16 Spanish version of this questionnaire was used to measure the transformational leadership
17 of teachers (Álvarez et al., 2018). It allows the evaluation of the perception that students
18 have about the behaviors of their teachers related to the transformational leadership style.
19 The TTQ begins with the stem “My physical education teacher...”. It consists of 16 items
20 and four factors (each with four items) to measure individualized consideration (e.g.
21 “Shows that s/he cares about me”), idealized influence (e.g. “Acts as a person that I look
22 up to”), intellectual stimulation (e.g. “Creates lessons that really encourage me to think”),
23 and inspirational motivation (e.g. “Is enthusiastic about what I am capable of achieving”).
24 They were answered on a Likert-type scale from one (never) to five (always). The internal
25 consistency analysis (Cronbach's alpha) showed values of .89 for individualized
26 consideration, .85 for idealized influence, .83 for intellectual stimulation and .91 for
27 motivational inspiration. In the present study the Confirmatory Factor Analysis (CFA)
28 indicated the following goodness-of-fit indexes: $\chi^2(98) = 367.83$; $p < .001$; Comparative
29 Fit Index (CFI)= .96; Tucker-Lewis Index (TLI)= .95; Standard Root Mean Residual
30 (SRMR)= .031; Root Mean Square Error of Approximation (RMSEA)= .076 90%
31 Confidence Interval (CI) [.068, .084].
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54 **Ego and Task Orientation Questionnaire (TEOSQ)** (Duda and Nicholls, 1992).

55 The Spanish version adapted to PE was used to measure the motivational orientation of
56 students (Balaguer et al., 1996). It consists of a 13-item questionnaire designed to assess
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3 task (seven items) and ego (six items) orientations. When completing the instrument, the
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5 participants were requested to think about when they felt most successful in PE tasks and
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7 then to indicate their agreement with items reflecting task orientation (e.g. "I feel that a
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9 skill I have learned works") and ego orientation (e.g. "When others can't do it as well as
10
11 me"). Responses were collected using a five-point Likert-type scale, ranging from
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13 strongly disagree (one) to strongly agree (five). Internal consistency analyses (Cronbach's
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15 alpha) provided values of .84 for the task orientation factor, and .88 for ego orientation.
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17 In the present study, the CFA displayed the following goodness-of-fit indexes: χ^2 (64) =
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19 198.91; $p < .001$; CFI= .95; TLI= .94; SRMR= .055; RMSEA= .066 90% CI [.056, .077].
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24 **Intrinsic Satisfaction in Sport Instrument (SSI-EF)** (Duda and Nicholls, 1992).

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26 The Spanish version of the Sport Satisfaction Instrument adapted to PE from the original
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28 Sport Satisfaction Instrument was used to measure the level of enjoyment in PE (Balaguer
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30 et al., 1997; Baena-Extremera et al., 2012). It measures intrinsic satisfaction through eight
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32 items and two factors: enjoyment, consisting of five items (e.g. "I usually have enjoyment
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34 in the PE classes"), and boredom consisting of three items (e.g. "In PE, I usually wish the
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36 class would end quickly"). It is answered on a Likert-type scale from one (do not agree
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38 at all) to four (strongly agree). The internal consistency analysis (Cronbach's alpha) gave
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40 values of .87 for the enjoyment factor, and .73 for boredom. In the present study the CFA
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42 showed the following goodness-of-fit indexes: χ^2 (19) = 40.73; $p = .003$; CFI= .99; TLI=
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44 .98; SRMR= .033; RMSEA= .049 90% CI [.029, .070].
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50 *Procedure*

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54 Non-probabilistic convenience sampling was used. All of them had similar
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56 socioeconomic characteristics and followed the same curriculum. A letter was sent to the
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58 school management and PE teachers, informing them of the purpose of the research and
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3 requesting their collaboration. Once their consent was obtained, the parents/guardians of
4 the students were informed about the voluntary nature of participation and the anonymous
5 treatment of data, and their consent was obtained for their children's participation.
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7 Afterwards, the purpose of the study was explained to the students, indicating that
8 participation was voluntary and anonymous. Throughout the research process, the
9 principles established in the Declaration of Helsinki (World Medical Association, 2013)
10 were respected and approval was obtained from the ethics committee of Malaga
11 University to carry out the research.
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21 The questionnaires were distributed at the beginning of May 2021. The data were
22 collected during the PE class and the students completed the questionnaires in
23 approximately 40 minutes. A researcher from our team provided detailed instructions on
24 how to complete the questionnaires and addressed any questions that arose.
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32 *Data analysis*

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35 Means, standard deviations and bivariate correlations were analyzed for all studied
36 variables. To test the hypothesized model, a two-step maximum likelihood approach was
37 performed following the recommendations proposed by Kline (2016) in IBM SPSS Amos
38 v.27. First, a CFA was performed to analyze the psychometric properties of the proposed
39 model. Composite Reliability (CR) via the Raykov (1997) formula was used to assess the
40 internal consistency, considering .70 as the cut-off value (Hair et al., 2019), while average
41 variance extracted (AVE) was estimated to analyze convergent validity (Hair et al., 2019).
42 Discriminant validity was established when the correlation coefficients were lower than
43 the AVE for each construct exceeding the squared correlations between that construct and
44 any other (Fornell and Larcker, 1981). Secondly, structural equation modeling (SEM)
45 was performed to test the proposed relationships among different constructs.
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3 Standardized direct and indirect effects on the variable outcome were analyzed,
4 considering that the effects were significant if the confidence interval (at 95%) did not
5 include zero (Williams and MacKinnon, 2008). The Bootstrap resampling (1000 samples)
6 considering a bias corrected 95% CI was used to assess the significance of the direct and
7 indirect effects. For CFA and SEM, the following absolute and incremental indexes were
8 used for analysis, specifically: CFI, TLI, SRMR and RMSEA with its CI (90%). For these
9 indexes, scores of CFI and TLI ≥ 0.90 , SRMR and RMSEA ≤ 0.8 were considered as
10 acceptable, following several recommendations (e.g. Byrne, 2016; Hair et al., 2019;
11 Marsh et al., 2004).

27 **Results**

32 *Preliminary analysis*

35 Full Information robust Maximum Likelihood (FIML) was used to handle the small
36 amount of missing data at the item level (missing at random= 2%) as proposed by Enders
37 (2022). Then, we moved forward to analyzing the descriptive statistics and bivariate
38 correlations. In addition, the values of Skewness and Kurtosis (between -2 to +2 and -7
39 to +7, respectively) revealed no deviations from univariate normality (Hair et al., 2019).
40 However, the normalized estimate of Mardia's coefficient of multivariate kurtosis was
41 greater than 5.0 in all samples under analysis. Consequently, Bollen-Stine bootstrap on
42 2000 samples was employed for subsequent analysis (Nevitt and Hancock, 2001).

45 Before conducting a SEM analysis, a multilevel analysis was performed in SPSS
46 to examine whether school and gender variables could influence the relationships among
47 the variables under analysis. Thus, four multilevel models were tested, two for the
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3 enjoyment variable and two for the boredom variable considering school and gender,
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5 respectively. The results showed that the slope and the intercept of the straight lines were
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7 the same across all schools and genders, indicating that school and gender did not
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9 influence the relationships among variables included in the study. Results were as
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11 follows: Schools: Boredom (*Wald Z test*= 1.03, *p*=.299); Enjoyment (*Wald Z test*= 1.51,
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13 *p*=.130). Gender: Boredom (*Wald Z test*= .421, *p*=.674); Enjoyment (*Wald Z test*= .659,
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15 *p*=.510). Therefore, the conditions for SEM analysis were warranted for all schools and
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17 genders.
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22 Table 1 shows descriptive statistics, CR coefficients, average variance extracted,
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24 and latent correlations. Skewness and kurtosis were contained within cutoffs, showing a
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26 normal distribution. In addition, CR coefficients had a good internal consistency (>0.70).
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28 Related to latent correlations, most of the variables displayed statistically significant
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30 correlations. Most of the relationships were positive, but boredom was negatively related
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32 to all variables except ego orientation.
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42 However, although the CR coefficients were adequate (>0.70), as well as most of
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44 the values of the average variance extracted (AVE) (>0.50), the discriminant validity was
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46 not adequate. Due to the high correlation between the factors of the transformational
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48 leadership questionnaire, the square of the correlations was in some cases greater than the
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50 AVE. Furthermore, due to the high collinearity of these factors, the measurement model
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52 tested was incorrect and could not be performed.
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55 To resolve this issue, a second-order factor was generated from the four factors of
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57 the transformational leadership questionnaire, and the measurement model and the
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59 structural equation model were developed with the new variable.
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3 Table 2 shows the descriptive statistics, CR coefficients, the average variance
4 extracted, and latent correlations of the variables after introducing the second order factor.
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6 Skewness and kurtosis showed a normal distribution. Moreover, the values of the CR
7 coefficients and AVE were adequate, except for average variance extracted for task
8 orientation, which was below the cut-off level (.05). As for the latent correlations, most
9 of the variables displayed statistically significant and positive correlations. However, the
10 relationships between boredom with transformational leadership, task orientation and
11 enjoyment were negative.
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28 *Measurement and structural model*

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31 Measurement models and structural equations were generated. The analysis of
32 measurement model, which included transformational leadership, ego orientation, task
33 orientation, enjoyment and boredom variables, displayed an acceptable fit to the data: χ^2
34 (265) = 674.099; $p < .001$; CFI= .96; TLI= .96; SRMR= .050; RMSEA= .057 90% CI
35 [.052, .062]. CR coefficients for each factor showed scores above the cutoff (>0.70)
36 revealing adequate internal consistency. Convergent validity was achieved for all factors,
37 being above the cut-off value (0.50), except task orientation, where the values obtained
38 were below the cut-off. In addition, considering the squared correlations and AVE scores,
39 all factors demonstrated adequate discriminant validity since the squared correlations of
40 each latent variable were lower than AVE scores in each latent variable. Therefore, the
41 results provided preliminary support to conduct a regression model and analyze the direct
42 and indirect effects across variables under analysis. Looking at the results, the structural
43 model displayed an acceptable fit to the data: χ^2 (267) = 829.276; $p < .001$; CFI= .95;
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3 TLI= .94; SRMR= .070; RMSEA= .066 90% CI [.061, .072]. Hence, direct, and indirect
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5 paths were analyzed.
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9 Overall, significant direct effects were found (Table 3; Figure 1): (a)
10 transformational leadership was positively associated with task orientation and
11 enjoyment, and negatively associated with boredom; (b) task orientation was positively
12 associated with enjoyment, and negatively associated with boredom; (c) ego orientation
13 was positively associated with boredom.
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21 Regarding indirect effects, several results emerged (Table 3): (a) transformational
22 leadership had a positive and indirect effect on enjoyment through task orientation; (b)
23 transformational leadership had a negative and indirect effect on boredom through task
24 orientation.
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41 **Discussion**

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44 The aim of the present study was to examine how teachers' transformational style related
45 to enjoyment and boredom in PE classes. In addition, the mediating effect of motivational
46 orientation (ego vs. task) on these relationships was analyzed. After analyzing the data
47 from the structural equation model, all the hypotheses were accepted except one. No
48 statistically significant associations were found between transformational style and ego-
49 oriented motivation. Therefore, the hypothesis that transformational style was negatively
50 related to ego-oriented motivation was rejected.
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3 First, the results highlighted statistically significant and positive relationships
4 between the transformational leadership style of the teacher and the satisfaction perceived
5 by the students, while this relationship was negative with respect to boredom. These
6 findings are in line with previous studies (Antunes et al., 1999; Lebrero et al., 2019),
7 which highlight how the transformational style adopted by the teacher was associated
8 with greater enjoyment and satisfaction with the activities practiced in class. In turn, these
9 studies indicate that students show a high commitment, participation, and emotional
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21 Specifically, Beauchamp et al. (2014) concluded that the transformational style
22 adopted by PE teachers in their relationship with students has the capacity to predict
23 enjoyment in PE and, at the same time, predicts physically active behaviors in their free
24 time. This can be attributed, among other reasons, to the implementation of a planned
25 teaching intervention, which involves teachers adopting didactic strategies that shape a
26 movement space where students interact and perceive rewarding emotions, and in which
27 they are allowed to actively participate (Zueck et al., 2020). This involvement of students
28 influences affective attitudes, in favour of enjoyment and against boredom (Lebrero et
29 al., 2019; Beauchamp, 2014). Specifically, teachers should encourage greater
30 involvement by promoting the design of tasks and decision- making by the students
31 themselves using transformational leadership that adopts teaching styles and didactic
32 strategies based on supported autonomy to achieve greater participation and enjoyment
33 of PA (Fin et al., 2019).
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51 The relationship between a transformational style adopted by teachers and the
52 enjoyment and satisfaction of students in PE is highly relevant in the school context since
53 it is associated with improved academic results (Baños et al., 2020). If teachers develop
54 behaviors and strategies that facilitate student enjoyment, students will feel more satisfied
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3 and eager to face the challenges posed in class (Baños et al., 2019). In addition, academic
4 performance will improve as a result of a transfer of responsibility from teachers to
5 students, enabling them to make decisions that recognise effort and self-improvement
6 (Escriva-Boulley, 2018; Cheon, 2012; Ntoumanis, 2018). For all these reasons, it is
7 important for teachers to adopt a transformational style that promotes autonomy and
8 enjoyment, while avoiding monotony and boredom (Baena-Extremera and Granero-
9 Gallegos, 2015; Lamoneda, 2020; Lebrero et al. 2019).

19 Second, the results reveal a statistically significant and positive relationship
20 between transformational leadership and task-oriented motivation. These findings align
21 with previous studies that evidenced the importance of adopting a transformational
22 teaching style to generate a task orientation (Castillo et al. 2020), which has also been
23 associated with the promotion of healthy habits and the intention to engage in PA outside
24 of school hours (Álvarez et al., 2018; Granger et al., 2017). Thus, PE teachers who adopt
25 this behavioral style improve the classroom climate, promote more effective learning and
26 encourage active and healthy behaviors to be extended outside school hours (Castillo et
27 al., 2020; View et al., 2009).

40 Third, the analyses revealed a positive relationship between task orientation and
41 enjoyment/satisfaction and a negative relationship with boredom. Ego oriented
42 motivational orientation was positively related to boredom. These results are in line with
43 those found in previous research in the school context, in PE class (Duda et al., 1992;
44 Kalaja et al., 2009; Granero-Gallegos et al., 2012; Reigal et at., 2022), which indicated
45 that task-oriented motivation was correlated with higher amounts of enjoyment and
46 satisfaction in the activity practiced, and that ego orientation was linked to boredom. This
47 could be because task-oriented motivation focuses on more intrinsic elements such as
48 effort and personal progress, increasing the positive affective outcomes (e.g. enjoyment),
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3 which is associated with improved learning in which attention to teacher instructions,
4 correct task execution and a context of satisfaction and enjoyment predominate (Zueck et
5 al., 2020). On the other hand, ego-oriented motivation generates a greater focus on
6 winning and outperforming others, leading students to perceive their progress as
7 dependent on their ability and the performance of their peers (Zueck et al., 2020), which
8 increases the pressure that a high level of competence demands (Jaakkola et al., 2017;
9 Reigal et al., 2022). This greater competitiveness and demands can increase student
10 frustration, even leading to boredom if not adequately addressed (García-González et al.,
11 2019; Moreno et al., 2011; Coterón-López et al., 2013).

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24 Fourth, indirect relationships were observed between transformational leadership
25 style and enjoyment/boredom, mediated by task-oriented motivation. This implies that
26 motivational orientation explains some relationships between transformational leadership
27 and levels of enjoyment or boredom. Specifically, although the direct relationship
28 between transformational leadership and enjoyment is positive and statistically
29 significant, when ego-oriented motivation mediates, these relationships do not appear.
30 That is, ego-oriented motivation is affecting these relationships and is part of the
31 explanatory effect between them. Likewise, it is observed that in the relationship between
32 transformational leadership and boredom, ego-oriented motivation acts as a mediator and
33 determines the non-existence of statistically significant effects. This finding is relevant
34 because it indicates that, when teachers use a transformational leadership style in their
35 classes, the ego-oriented motivation of their students is implicated in the impact of this
36 style of interaction on enjoyment and boredom. Therefore, if teachers develop a
37 transformational leadership style and contribute to promoting task-oriented motivation in
38 students, it could improve the satisfaction that students experience (feeling that the
39 activity is enjoyable) and promote their participation in PE class, further facilitating their
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3 intention to continue with the activity and improve their participation outside school
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8 Several studies (Antunes et al., 1999; Lebrero, Almagro and Sáenz-López, 2019)
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10 have explored the relationship between transformational teaching and enjoyment and
11
12 boredom in PE class, but few have analyzed the mediating effect of motivational
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14 orientation. In this sense, the results of this study indicate that the transformational
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16 teaching style of PE teachers, which creates a positive learning climate, could be a
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18 requirement for successful teaching where students experience enjoyment. These findings
19
20 are related to the research of Castillo et al. (2020), who add that the transformational
21
22 teaching style of PE teachers can improve passion, motivation and self-determination, in
23
24 addition to promoting high levels of participation in PA outside of PE classes. Other
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26 studies also support these findings, showing that teachers who exhibit transformative
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28 teaching behaviors enhance the positive classroom climate, which, in turn, promotes
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30 learning effectiveness (Álvarez et al., 2019; DeMulderet al., 2009).
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36 This study has certain limitations that should be taken into consideration. Firstly,
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38 the information was obtained through self-reported measures and the study design is
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40 cross-sectional. In future research it will be important to adopt a longitudinal approach to
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42 identify causal relationships and to include some objective observational measures of
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44 teachers' leadership style. Secondly, given that we solely relied on student perceptions, it
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46 would be useful to assess whether teachers perceive themselves as using a
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48 transformational teaching approach in PE class. In relation to this point, it should be noted
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50 that neither the teaching styles used nor the content covered in class were analyzed.
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52 Furthermore, the study focused on a group aged between 13 and 18 years, so it would be
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54 interesting for future studies to examine the relationships between the variables under
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56 study within more specific age ranges. It would be interesting conduct intervention
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3 studies that focus on both transformational leadership and motivational orientations in
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5 order to observe how the attitude of students in PE classes can be modified. Finally, future
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7 studies should examine the possible moderating role of gender and age on the variables
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9 analyzed.
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12 In conclusion, the results obtained in this study show that a transformational
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14 teacher leadership style is associated to greater enjoyment and less boredom among
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16 students in PE class. In addition, the study showed a mediating effect of motivational
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18 orientation in the relationships between transformational leadership and enjoyment and
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20 boredom, highlighting the neutralizing effect on enjoyment when students manifest ego-
21
22 oriented motivation. These results are relevant because, if students enjoy their PE classes,
23
24 they are more likely to engage in PA during their free time, which will result in the
25
26 acquisition of healthy habits and an improvement in their health and quality of life.
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28 Therefore, these results suggest that teachers should be trained and acquire tools to
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30 improve their style of interaction with students, as well as improve their skills in
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32 promoting task-oriented motivation. This way, the opportunities for children to
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34 experience enjoyment in PE classes may be increased.
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44 **References**

45
46
47 Álvarez O, Castillo I, Molina-García V, et al. (2019) Transformational leadership, task-
48
49 involving climate, and their implications in male junior soccer players: A multilevel
50
51 approach. *International Journal of Environmental Research and Public Health*
52
53 16(19): 3649.
54
55
56
57
58
59
60

- 1
2
3 Álvarez O, Lila M, Tomás I, et al. (2014) Transformational leadership in the local police
4 in Spain: A leader-follower distance approach. *The Spanish Journal of Psychology*
5 17: e42.
6
7
8
9
10
11 Álvarez O, Tomas I, Estevan I, et al. (2018) Assessing teacher leadership in physical
12 education: The Spanish version of the Transformational Teaching Questionnaire.
13 *Anales de Psicología* 34(2): 405-411.
14
15
16
17
18
19 Ames C (1984) Competitive, cooperative, and individualistic goal structures: a cognitive-
20 motivational analysis. In: Ames R and Ames C (eds) *Research on motivation: Vol.*
21 *1. Student motivation*. Orlando. Academic Press, pp 177-207.
22
23
24
25
26
27 Antunes I, Serpa S, and Carita I (1999). Leadership and satisfaction in physical education.
28 *Journal of Sport Psychology* 8(1): 147-162.
29
30
31
32
33 Arnold KA, Turner N, Barling J, et al. (2007) Transformational leadership and
34 psychological well-being: The mediating role of meaningful work. *Journal of*
35 *Occupational Health Psychology* 12(3): 193–203.
36
37
38
39
40
41 Baena-Extremera A and Granero-Gallegos A (2014) Prediction model of satisfaction with
42 Physical Education and school. *Revista de Psicodidáctica* 20(1): 177–192.
43
44
45
46
47 Baena-Extremera A, Gómez-López M, Granero-Gallegos A, et al. (2014) Motivation,
48 motivational climate and importance of Physical Education. *Procedia - Social and*
49 *Behavioral Sciences* 132: 37–42.
50
51
52
53
54
55 Balaguer I, Atienza FL, Castillo I, Moreno, et al. (1997) Factorial structure of measures
56 of satisfaction/interest in sport and classroom in the case of Spanish adolescents.
57 In: *4th European Conference of Psychological Assessment*.
58
59
60

1
2
3 Balaguer I., Castillo I and Tomás I (1996) Análisis de las propiedades psicométricas del
4
5 Cuestionario de Orientación al Ego y a la Tarea en el Deporte (TEOSQ) en su
6
7 traducción al castellano. *Psicológica* 17: 71-81.
8
9

10
11 Baños R, Baena-Extremera A, Ortiz-Camacho MM, et al. (2019) Influencia de las
12
13 competencias Del Profesorado de Secundaria en los comportamientos disruptivos
14
15 en el aula | influence of the competences of secondary teachers on disruptive
16
17 behavior in the classroom. *Espiral. Cuadernos del Profesorado* 12(24): 3–10.
18
19

20
21 Baños R, Fuentesal J, Conte L, et al. (2020) Satisfaction, enjoyment and boredom with
22
23 physical education as mediator between autonomy support and academic
24
25 performance in Physical Education. *International Journal of Environmental*
26
27 *Research and Public Health* 17(23): 8898.
28
29

30
31 Baños R, Marentes-Castillo M, Zamarripa J, et al. (2019) Satisfacción, aburrimiento e
32
33 Importancia de la Educación Física en la intención de realizar Actividad Física
34
35 extraescolar en adolescentes mexicanos. *Cuadernos de Psicología del Deporte*
36
37 19(3): 205–215.
38
39

40
41 Barling J, Weber T and Kelloway EK (1996) Effects of transformational leadership
42
43 training on Attitudinal and financial outcomes: A field experiment. *Journal of*
44
45 *Applied Psychology* 81(6): 827–832.
46
47
48

49
50 Bass BM (1985) *Leadership and performance beyond expectations*. New York: Free
51
52 Press.
53
54

55
56 Bass BM (1997) Does the transactional–transformational leadership paradigm transcend
57
58 organizational and national boundaries? *American Psychologist* 52(2): 130–139.
59
60

- 1
2
3 Bass BM and Riggio RE (2006). *Transformational leadership*. New York: Psychology
4
5 press.
6
7
8
9 Beauchamp MR and Morton KL (2011) Transformational teaching and physical activity
10
11 engagement among adolescents. *Exercise and Sport Sciences Reviews* 39(3): 133–
12
13 139.
14
15
16
17 Beauchamp MR, Barling J, Zhen Li, et al. (2010) Development and psychometric
18
19 properties of the transformational teaching questionnaire. *Journal of Health*
20
21 *Psychology* 15(8): 1123–1134.
22
23
24
25 Beauchamp MR, Liu Y, Morton KL, et al. (2013) Transformational teaching and
26
27 adolescent physical activity: Multilevel and mediational effects. *International*
28
29 *Journal of Behavioral Medicine* 21(3): 537–546.
30
31
32
33 Bortoli L, Robazza C (2007) Dispositional goal orientations, motivational climate, and
34
35 psychobiosocial states in physical education. In: Chiang LA (ed.) *Motivation of*
36
37 *Exercise and Physical Activity*. New York: Nova Science Publishers, pp.119–133.
38
39
40
41 Bortoli L, Bertollo M and Robazza C (2009) Dispositional goal orientations, motivational
42
43 climate, and Psychobiosocial states in Youth Sport. *Personality and Individual*
44
45 *Differences* 47(1): 18–24.
46
47
48
49 Braithwaite R, Spray CM and Warburton VE (2011) Motivational Climate Interventions
50
51 in physical education: A meta-analysis. *Psychology of Sport and Exercise* 12(6):
52
53 628–638.
54
55
56
57 Burns N (1978) *Leadership*. New York: Harper and Row.
58
59
60

- 1
2
3 Byrne BM (2016) *Structural Equation Modelling with AMOS: Basic Concepts,*
4 *Applications, and Programming.* New York: Routledge
5
6
7
8
9 Castillo I, Molina-García J, Estevan I, et al. (2020) Transformational teaching in Physical
10 Education and students' leisure-time physical activity: The mediating role of
11 learning climate, passion and self-determined motivation. *International Journal of*
12 *Environmental Research and Public Health* 17(13): 4844.
13
14
15
16
17
18
19 Cecchini JA, González C, López J, and Brustad R (2005) Relationships of perceived
20 motivational climate with goal orientation, intrinsic motivation, and fair play views
21 and behaviors. *Mexican Journal of Psychology* 22(2): 429-479
22
23
24
25
26
27 Cervantes-Holguín E and Gutiérrez-Sandoval PR (2020) El profesorado como agente de
28 cambio educativo: Entre la docencia Y la investigación. *Revista Educación y*
29 *Ciudad* 38: 59-72.
30
31
32
33
34
35 Cervelló EM, Jiménez R, del Villar F, et al. (2004) Goal orientations, motivational
36 climate, equality, and discipline of Spanish physical education students. *Perceptual*
37 *and Motor Skills* 99(1): 271–283.
38
39
40
41
42
43 Cheon SH, Reeve J and Moon IS (2012) Experimentally based, longitudinally designed,
44 teacher-focused intervention to help physical education teachers be more autonomy
45 supportive toward their students. *Journal of Sport and Exercise Psychology* 34(3):
46 365–396.
47
48
49
50
51
52
53 Choi SM, Sum KW, Leung FL, et al. (2020) Effect of sport education on students'
54 perceived physical literacy, motivation, and physical activity levels in university
55
56
57
58
59
60

1
2
3 required physical education: A cluster-randomized trial. *Higher Education* 81(6):
4
5 1137–1155.
6
7

8
9 Cid L, Pires A, Borrego C, et al. (2019) Motivational determinants of physical education
10
11 grades and the intention to practice sport in the future. *PLOS ONE* 14(5): e0217218.
12
13

14
15 Coterón-López J., Franco-Álvarez E., Pérez-Tejero J, and Sampedro J (2013)
16
17 Motivational climate, perceived competence, commitment and anxiety in Physical
18
19 Education. Differences according to the compulsory nature of teaching. *Journal of*
20
21 *Sport Psychology* 22(1): 151-157
22
23

24
25 Di Battista R, Robazza C, Ruiz MC, et al. (2018) Student intention to engage in leisure-
26
27 time physical activity: The interplay of task-involving climate, competence need
28
29 satisfaction and Psychobiosocial states in Physical Education. *European Physical*
30
31 *Education Review* 25(3): 761–777.
32
33

34
35 Duda JL (1995). *Motivation in sport settings: A goal perspective approach*.
36
37

38
39 Duda JL and Nicholls JG (1992) Dimensions of achievement motivation in schoolwork
40
41 and sport. *Journal of Educational Psychology* 84(3): 290–299.
42
43

44
45 Duda JL, Fox KR, Biddle SJ and Armstrong N (1992) Children's achievement goals and
46
47 beliefs about success in sport. *British Journal of Educational Psychology* 62(3):
48
49 313-323.
50
51

52
53 Duncan SJ, Schofield G, Duncan EK, et al. (2007) Effects of age, walking speed, and
54
55 body composition on pedometer accuracy in children. *Research Quarterly for*
56
57 *Exercise and Sport* 78(5): 420–428.
58
59
60

- 1
2
3 Enders CK (2022) *Applied Missing Data Analysis*. New York: The Guilford Press.
4
5
6
7 Escartí A and Brustad R (2000) The study of sport motivation from the goal theory
8
9 perspective. In: *I Spanish-Portuguese Congress of Psychology*. Santiago de
10
11 Compostela.
12
13
14
15 Escriva-Boulley G, Tessier D, Ntoumanis N, et al. (2018) Need-supportive professional
16
17 development in elementary school physical education: Effects of a cluster-
18
19 randomized control trial on teachers' motivating style and student physical activity.
20
21 *Sport, Exercise, and Performance Psychology* 7(2): 218–234.
22
23
24
25 Fin G, Moreno-Murcia JA, León J, et al. (2019) Interpersonal autonomy support style and
26
27 its consequences in physical education classes. *PLOS ONE* 14(5): e0216609.
28
29
30
31 Fornell C and Larcker DF (1981) Structural equation models with unobservable variables
32
33 and measurement error: Algebra and statistics. *Journal of Marketing Research*
34
35 18(3): 382–388.
36
37
38
39 Fraile-García J, Tejero-González CM, Esteban-Cornejo I, et al. (2019) Association
40
41 between enjoyment, motor self-efficacy, physical activity and academic
42
43 performance in physical education. *Retos* 36: 58–63.
44
45
46
47 García-González L, Sevil-Serrano J, Abós A, et al. (2019) The role of task and ego-
48
49 oriented climate in explaining students' bright and dark motivational experiences
50
51 in physical education. *Physical Education and Sport Pedagogy* 24(4): 344–358.
52
53
54
55 Granero-Gallegos A, Baena-Extremera A, Pérez-Quero FJ, et al. (2012) Analysis of
56
57 motivational profiles of satisfaction and importance of physical education in high
58
59 school adolescents. *Journal of Sports Science & Medicine* 11(4): 614-623.
60

- 1
2
3 Granger E, Williams G, Di Nardo F, et al. (2017) The relationship between physical
4 activity and self-rated health status in European adolescents: Results of the euro-
5 URHIS 2 survey. *European Journal of Public Health* 27(suppl 2): 107–111.
6
7
8
9
10
11 Guillamón AR, Cantó EG and López PJC (2018) Perception of health, physical activity
12 and physical fitness in schoolchildren. *Cuadernos de Psicología del Deporte* 18(3):
13 179-189.
14
15
16
17
18
19 Hair JF, Black WC, Babin BJ, et al. (2019) *Multivariate Data Analysis*. Hampshire, UK:
20 Cengage Learning, EMEA.
21
22
23
24
25 İlker GE and Demirhan G (2013) The effects of different motivational climates on
26 students' achievement goals, motivational strategies and attitudes toward physical
27 education☆. *Educational Psychology* 33(1): 59–74.
28
29
30
31
32
33
34 Jaakkola T, Yli-Piipari S, Barkoukis V, et al. (2017) Relationships among perceived
35 motivational climate, motivational regulations, enjoyment, and PA participation
36 among Finnish Physical Education Students. *International Journal of Sport and*
37 *Exercise Psychology* 15(3): 273–290.
38
39
40
41
42
43
44 Kalaja S, Jaakkola T, Watt A, et al. (2009) The associations between Seventh Grade
45 Finnish students' motivational climate, perceived competence, self-determined
46 motivation, and fundamental movement skills. *European Physical Education*
47 *Review* 15(3): 315–335.
48
49
50
51
52
53
54 Kantomaa MT, Tammelin T, Ebeling H, et al. (2015) High levels of physical activity and
55 cardiorespiratory fitness are associated with good self-rated health in adolescents.
56 *Journal of Physical Activity and Health* 12(2): 266–272.
57
58
59
60

- 1
2
3 Kark R, Shamir B and Chen G (2003) The Two Faces of Transformational Leadership:
4
5 Empowerment and dependency. *Journal of Applied Psychology* 88(2): 246–255.
6
7
8
9 Katewongsa P, Choolers P, Saonuan P, et al. (2022) Effectiveness of a whole-of-school
10
11 approach in promoting physical activity for children: Evidence from cohort study
12
13 in primary schools in Thailand. *Journal of Teaching in Physical Education* 1: 1–
14
15 10.
16
17
18
19 Kim M, Yu H and Kang BJ (2021) The impact of PE teachers' leadership on middle
20
21 school students. *Journal of Health, Sports, and Kinesiology* 2(1): 35–36.
22
23
24
25 Kline RB (2016) *Principles and practice of structural equation modeling*. London: The
26
27 Guilford Press.
28
29
30
31 Kavussanu M and Ntoumanis N (2003) Participation in sport and moral functioning: Does
32
33 ego orientation mediate their relationship? *Journal of Sport and Exercise*
34
35 *Psychology* 25(4): 501-518.
36
37
38
39 Lamonedá-Prieto J (2020) Effects of a bioecological program in responsibility and
40
41 satisfaction in Physical Education: A case study in contexts of Social Exclusion.
42
43 *Espiral. Cuadernos del Profesorado* 13(26): 54–63.
44
45
46
47 Lebrero-Casanova I, Almagro BJ and Sáenz-López P (2019) Participatory teaching styles
48
49 in physical education classes and their influence on different psychological aspects.
50
51 *Espiral. Cuadernos del Profesorado* 12(25): 30–39.
52
53
54
55 Lee MJ, Whitehead J, Ntoumanis N and Hatzigeorgiadis A (2008) Relationships among
56
57 values, achievement orientations, and attitudes in youth sport. *Journal of Sport &*
58
59 *Exercise Psychology* 30(5): 588-610.
60

- 1
2
3 Leisterer S and Gramlich L (2019) Students' Emotional Experience in Physical
4
5 Education—A Qualitative Study for New Theoretical Insights. *Sports* 7(1): 10.
6
7
8
9 Leisterer S and Gramlich L (2021) Having a positive relationship to physical activity:
10
11 Basic psychological need satisfaction and age as predictors for students' enjoyment
12
13 in physical education. *Sports* 9(7): 90.
14
15
16
17 Malloy E and Kavussanu M (2021) A comparison of authentic and transformational
18
19 leadership in Sport. *Journal of Applied Social Psychology* 51(7): 636–646.
20
21
22
23 Marsh HW, Hau K-T and Wen Z (2004) In Search of Golden Rules: Comment on
24
25 hypothesis-testing approaches to setting cutoff values for fit indexes and dangers in
26
27 overgeneralizing Hu and Bentler's (1999) findings. *Structural Equation Modeling:
28
29 A Multidisciplinary Journal* 11(3): 320–341.
30
31
32
33 Molero F, Cuadrado I, Navas M, et al. (2007) Relations and effects of transformational
34
35 leadership: A comparative analysis with traditional leadership styles. *The Spanish
36
37 Journal of Psychology* 10(2): 358–368.
38
39
40
41 Molina-García J, Queralt A, Estevan I, et al. (2016) Ecological correlates of Spanish
42
43 adolescents' physical activity during physical education classes. *European Physical
44
45 Education Review* 22(4): 479–489.
46
47
48
49 Moreno B, Castuera RJ, Arias AG, et al. (2011) Analysis of the perception of motivational
50
51 climate, basic psychological needs, self-determined motivation and discipline
52
53 behaviors of adolescent students in physical education classes. *European Journal
54
55 of Human Movement* 26: 1-24
56
57
58
59
60

- 1
2
3 Moreno RA (2020) Transformational leadership. *Gestio et Productio. Electronic Journal*
4
5 *of Managerial Sciences* 2(3): 22-39
6
7
8
9 Morton KL, Keith SE and Beauchamp MR (2010) Transformational teaching and
10
11 physical activity. *Journal of Health Psychology* 15(2): 248–257.
12
13
14 Nevitt J and Hancock G (2001) Performance of bootstrapping approaches to model test
15
16 statistics and parameter standard error estimation in structural equation modeling.
17
18 *Structural Equation Modeling: A Multidisciplinary Journal* 8(3): 353–377.
19
20
21
22
23 Nicholls JG (1984) Achievement motivation: Conceptions of ability, subjective
24
25 experience, task choice, and performance. *Psychological Review* 91(3): 328–346.
26
27
28
29 Ntoumanis N, Quested E, Reeve J, et al. (2017) Need-supportive communication.
30
31 *Persuasion and Communication in Sport, Exercise, and Physical Activity*: 155–169.
32
33
34
35 Ovcharuk V, Maksymchuk B, Ovcharuk V, et al. (2021) Forming competency in health
36
37 promotion in technical specialists using Physical Education. *Revista Romaneasca*
38
39 *pentru Educatie Multidimensionala* 13(3): 01–19.
40
41
42
43 Papaioannou A (1998) Goal perspectives, reasons for being disciplined, and self-reported
44
45 discipline in Physical Education Lessons. *Journal of Teaching in Physical*
46
47 *Education* 17(4): 421–441.
48
49
50
51 Papaioannou A, Marsh HW and Theodorakis Y (2004) A multilevel approach to
52
53 motivational climate in Physical Education and sport settings: An individual or a
54
55 group level construct? *Journal of Sport and Exercise Psychology* 26(1): 90–118.
56
57
58
59
60

- 1
2
3 Piccolo RF and Colquitt JA (2006) Transformational leadership and job behaviors: The
4
5 mediating role of Core Job Characteristics. *Academy of Management Journal* 49(2):
6
7 327–340.
8
9
10
11 Raykov T (1997) Estimation of composite reliability for congeneric measures. *Applied*
12
13 *Psychological Measurement* 21(2): 173–184.
14
15
16
17 Reeve J, Jang H, Carrell D, et al. (2004) Enhancing students' engagement by increasing
18
19 teachers' autonomy support. *Motivation and Emotion* 28(2): 147–169.
20
21
22
23 Roberts GC, Treasure DC and Conroy DE (2007) Understanding the dynamics of
24
25 motivation in sport and physical activity: An achievement goal interpretation. In
26
27 Tenenbaum G and Eklund R (Eds.) *Handbook of sport psychology*. Hoboken, NJ:
28
29 Wiley, pp 3-30.
30
31
32
33 Sevil-Serrano J, Aibar A, Abós Á, et al. (2020) Improving motivation for physical activity
34
35 and physical education through a school-based intervention. *The Journal of*
36
37 *Experimental Education* 90(2): 383–403.
38
39
40
41 Slavich GM and Zimbardo PG (2012) Transformational teaching: Theoretical
42
43 underpinnings, basic principles, and core methods. *Educational Psychology Review*
44
45 24: 569-608.
46
47
48
49 Standage M and Treasure DC (2002) Relationship among achievement goal orientations
50
51 and multidimensional situational motivation in Physical Education. *British Journal*
52
53 *of Educational Psychology* 72(1): 87–103.
54
55
56
57 Stock C (2022) Grand Challenges for Public Health Education and promotion. *Frontiers*
58
59 *in Public Health* 10: 917685.
60

- 1
2
3 Tereza-Araujo A and Dosil J (2016) Relationships between attitudes and practice of
4 physical activity and sport in men and women. *Cuadernos de Psicología del*
5 *Deporte* 16(3): 67-72.
6
7
8
9
10 Thyfault EE and Bergouignan A (2020). Exercise and metabolic health: beyond skeletal
11 muscle. *Diabetologia* 63: 1464–1474
12
13
14
15 Tomczak M, Walczak M, Kleka P, et al. (2020) Psychometric Properties of the Polish
16 version of task and ego orientation in sport questionnaire (TEOSQ). *International*
17 *Journal of Environmental Research and Public Health* 17(10): 3593.
18
19
20
21
22
23
24 Trigueros R, Padilla A, Aguilar-Parra JM, et al. (2020) The influence of transformational
25 teacher leadership on academic motivation and resilience, Burnout and academic
26 performance. *International Journal of Environmental Research and Public Health*
27 17(20): 7687.
28
29
30
31
32
33
34 Usán Supervía P, Salavera Bordás C and Lorente VM (2020) The mediating role of goal
35 orientation (Task) in the relationship between engagement and academic self-
36 concept in students. *International Journal of Environmental Research and Public*
37 *Health* 17(22): 8323.
38
39
40
41
42
43
44 View JL, DeMulder EK, Kayler M, et al. (2009) Cultivating transformative leadership in
45 P-12 schools and classrooms through Critical Teacher Professional Development.
46 *Journal of Curriculum and Instruction* 3(2), 39-52.
47
48
49
50
51
52 Williams J and MacKinnon DP (2008) Resampling and distribution of the product
53 methods for testing indirect effects in complex models. *Structural Equation*
54 *Modeling: A Multidisciplinary Journal* 15(1): 23–51.
55
56
57
58
59
60

1
2
3 World Medical Association Declaration of helsinki (2013) *JAMA* 310(20): 2191-2194.
4
5

6 Xiang P, McBride RE and Bruene A (2006) Fourth-grade students' motivational changes
7
8 in an elementary physical education running program. *Research Quarterly for*
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
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47
48
49
50
51
52
53
54
55
56
57
58
59
60

Exercise and Sport 77(2): 195–207.

Yli-Piipari S, Watt A, Jaakkola T, et al. (2009) Relationships between physical education students' motivational profiles, enjoyment, state anxiety, and self-reported physical activity. *Journal of sports science & medicine* 8(3): 327.

Zueck Enríquez MD, Ramírez-García AA, Rodríguez-Villalobos JM, et al. (2019) Satisfacción en las clases de educación física y la intencionalidad de ser activo en Niños del Nivel de Primaria (satisfaction in the physical education classroom and intention to be physically active in primary school children). *Retos* (37): 33–40.

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Table 1. Descriptive statistics, composite reliability coefficients, average variance extracted, and latent correlations.

Variables	M	SD	S	K	CR	AVE	1	2	3	4	5	6	7
1. Individual consideration	3.76	.85	-.96	.29	.89	.67	-						
2. Idealized influence	4.21	.96	-.94	.25	.87	.62	.97**	-					
3. Intellectual stimulation	3.79	.87	-.82	.24	.83	.56	.96**	.97**	-				
4. Motivational inspiration	3.83	.88	-.93	.22	.91	.71	.99**	.99**	.97**	-			
5. Task orientation	4.16	.70	-1.22	1.65	.85	.44	.44**	.44**	.45**	.45**	-		
6. Ego orientation	2.76	1.02	.32	-.49	.88	.55	.06	.07	.09*	.07	.16**	-	
7. Enjoyment	3.42	.64	-1.27	1.17	.87	.57	.64**	.64**	.65**	.64**	.47**	.19**	-
8. Boredom	1.79	.79	1.03	.27	.76	.52	-.38**	-.38**	-.34**	-.38**	-.22**	.17**	-.52**

Notes: M = Mean; SD = Standard Deviation; S = Skewness; K = Kurtosis; CR = Composite Reliability coefficients; AVE = Average Variance Extracted.

* $p < 0.05$; ** $p < 0.01$.

Table 2. Descriptive statistics, composite reliability coefficients, average variance extracted, and latent correlations after introducing the second order factor.

Variables	M	SD	S	K	CR	AVE	1	2	3	4
1. Transformational leadership	2.75	1.03	.32	-.49	.99	.97	-			
2. Task orientation	4.17	.69	-1.22	1.66	.85	.44	.45**	-		
3. Ego orientation	3.27	.67	-1.14	1.01	.88	.55	.08	.16**	-	
4. Enjoyment	3.43	.64	-1.25	1.02	.87	.57	.65**	.47**	.19**	-
5. Boredom	1.79	.79	1.04	.31	.76	.52	-.37**	-.22**	.17**	-.52**

Notes: M = Mean; SD = Standard Deviation; S = Skewness; K = Kurtosis; CR = Composite Reliability coefficients; AVE = Average Variance Extracted.

* $p < 0.05$; ** $p < 0.01$.

Table 3. Direct and indirect effect coefficients.

	<i>p</i>	β	SE	95%CI	
				LB	UB
Direct effects					
Transformational leadership → Task orientation	.001	.46	.05	.36	.55
Transformational leadership → Ego orientation	.18	.08	.05	-.04	.17
Transformational leadership → Enjoyment	.001	.54	.05	.43	.63
Transformational leadership → Boredom	.001	-.37	.06	-.49	-.25
Task orientation → Enjoyment	.001	.28	.06	.17	.39
Task orientation → Boredom	.006	-.19	.06	-.31	-.06
Ego orientation → Enjoyment	.052	.09	.06	.01	.18
Ego orientation → Boredom	.001	.19	.05	.08	.30
Indirect effects					
Transformational leadership → Task orientation → Enjoyment	.001	.32	.06	.22	.44
Transformational leadership → Task orientation → Boredom	.001	-.21	.05	-.31	-.12
Transformational leadership → Ego orientation → Enjoyment	.151	.02	.02	-.01	.06
Transformational leadership → Ego orientation → Boredom	.057	.01	.01	-.01	.03

Notes: β = standardized regression coefficient; SE = Standardized Error; CI95% = 95% Confidence

Internal; LB = Lower Bound; UB = Upper Bound.

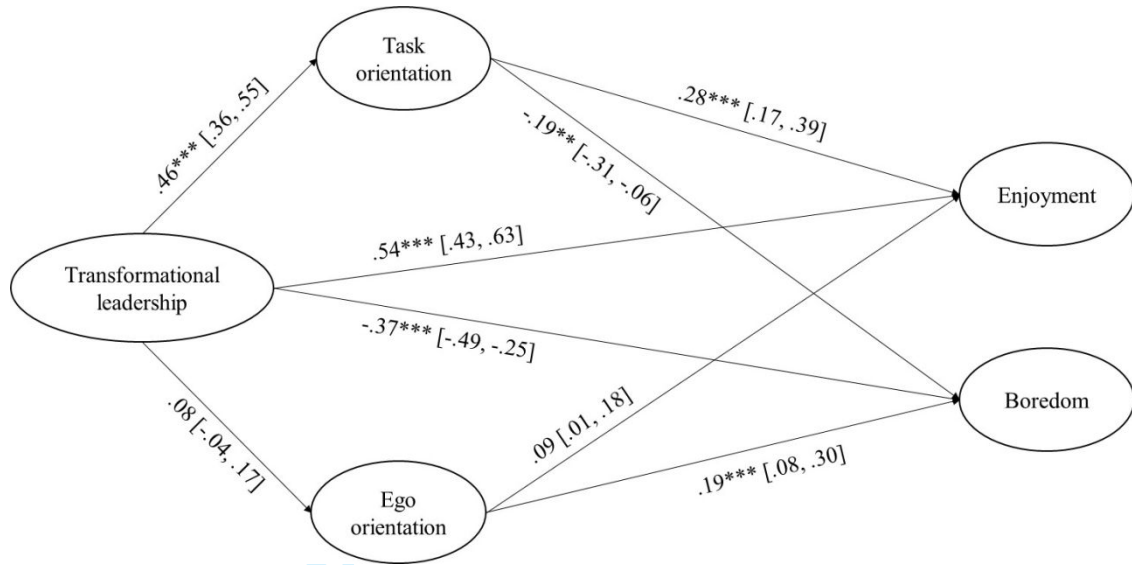


Figure 1. Direct effect coefficients (structural model).

** $p < .01$; *** $p = .001$