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Influence of internally and externally controlling teaching behaviors on students' motivational outcomes in Physical Education: Is there a gender difference?

22

Abstract

23 **Purpose:** Grounded in self-determination theory (SDT), this study examined gender
24 latent mean differences in students' perceptions of externally and internally controlling
25 teaching behaviors, basic psychological need (BPN) frustration, controlled motivation,
26 amotivation, and oppositional defiance in the physical education (PE) context.
27 Moreover, it analyzed the differentiated role that internally and externally controlling
28 behaviors play on these SDT-related variables among girls and boys. **Method:** A
29 sample of 1118 students ($M_{age}=14.11\pm 1.50$; 50.9% girls) participated in this research. A
30 multigroup structural equation modeling approach was performed to response the
31 research questions. **Results:** Analyses revealed that girls reported more maladaptive
32 outcomes in most SDT-related variables than boys. Although externally and internally
33 controlling behaviors from PE teachers were positively related to maladaptive
34 outcomes, both relate differently to boys and girls. **Conclusion:** Findings highlight the
35 importance of reducing externally controlling behaviors in boys and internally
36 controlling behaviors in both genders, but particularly in girls.
37 **Keywords:** self-determination theory, need-thwarting teaching, motivation, basic
38 psychological needs, sex.

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Introduction

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One of the main goals of Physical Education (PE) is to develop physically literate students who have the knowledge, skills, and confidence to participate in healthy physical activity throughout life (SHAPE America– Society of Health and Physical Educators, 2014). Students' positive experiences in PE have been identified as a key factor of the physical activity performed in and out of school (White et al., 2021). In contrast, negative experiences in PE are one of the main reasons for disengagement in PE lessons (Beltrán-Carrillo et al., 2012). Grounded in self-determination theory (SDT; Ryan & Deci, 2017), an important social-contextual factor that may influence students' motivational experiences is teachers' motivating style (Curran & Standage, 2017). Most previous studies have focused on the relationship between need-supportive behaviors of PE teachers and students' motivational experiences so far (Lochbaum & Jean-Noel, 2016; Vasconcellos et al., 2020). However, little attention has been paid to the impact of teachers' controlling behaviors, more specifically of its internal and external faces (De Meyer et al., 2016), on students' negative motivational experiences in PE. This pathway is known in SDT as the dark side of motivation (Bartholomew et al., 2011).

On the other hand, gender differences have been found in motivational variables in PE (Chu et al., 2019; Koka & Sildala, 2018; Shen, 2015). As girls are not engaged at the same level as boys in PE lessons (Mitchell et al., 2015; White et al., 2021), further studies should consider a gender perspective in the relationship between teachers' motivating style and students' motivational outcomes in PE. Due to the lack of previous research, there is a need to consider gender when analyzing the associations of teachers' internally and externally controlling behaviors on students' motivational outcomes in PE lessons. It will allow to theoretically deepen in whether the relationship between the

70 variables integrated in the dark side of motivation postulated by SDT are associated in a
71 similar or different way in boys and girls. Moreover, the identification of the
72 consequences associated with an internally and externally controlling behavior, on both
73 boys and girls, might be particularly useful to refrain from adopting controlling
74 strategies when teaching students in PE lessons. Based on SDT (Ryan & Deci, 2017),
75 the current research aspires to expand previous evidence by examining gender
76 differences in the relationships between the internal and external faces of controlling
77 behaviors of the teachers and students' motivational outcomes in PE.

78 **Self-Determination Theory and Teachers' (De)Motivating Styles**

79 Central to SDT is the assumption that interpersonal styles from socializing
80 agents (e.g., teachers) can enhance individuals' (e.g., students) motivation, behavior,
81 and wellbeing, depending on the fulfillment of three basic psychological needs (BPN)
82 (Ryan & Deci, 2017). In the context of school PE, one of the most important social-
83 contextual factors that influence students' motivational experiences is the
84 teachers' motivating styles (Curran & Standage, 2017; Vasconcellos et al., 2020; White
85 et al., 2021). Consistent with SDT, PE teachers can adopt simultaneously two
86 differentiated types of (de)motivating styles in terms of need-supportive behaviors and
87 controlling behaviors in PE lessons (Ryan & Deci, 2017; Vansteenkiste et al., 2020).

88 The present study pays particular attention to controlling behaviors, which,
89 compared to need-supportive behavior, have been notably less explored in PE. They
90 refer to those teaching behaviors aiming to use pressuring strategies toward students to
91 participate in learning activities in the way prescribed by the teacher (Reeve, 2009).
92 More particularly, SDT-based research currently emphasizes that a controlling teaching
93 style can be manifested in an internally way (i.e., seeming student indifference by
94 appealing to their feelings of self-worth) and in an externally way (i.e., use of

95 controlling language, yelling, pressure, and threats to students) (De Meyer et al., 2016;
96 Soenens et al., 2012). While internal controlling strategies are usually displayed in a
97 non-verbal way (e.g., withdrawing a student's attention because he or she does not meet
98 the teacher's expectations), external controlling strategies are usually clearly visible to
99 others (e.g., using phrases such as "should" and "must"). Regardless of the
100 consequences associated with controlling teaching behaviors, the assumptions of SDT
101 (Ryan & Deci, 2017; Vansteenkiste et al., 2020), suggest that controlling teaching styles
102 have been directly and positively related to the students' frustration of the BPN for
103 autonomy (i.e., feelings of external or self-imposed pressures), competence (i.e.,
104 feelings of inefficacy and failure), and relatedness (i.e., feelings of loneliness and social
105 exclusion) of students, which, in turn, has been positively related to controlled
106 motivation (i.e. participation in an activity due to external reasons such as avoidance of
107 feelings of guilt or shame or to obtained rewards) and amotivation (i.e., the complete
108 lack of volition to participate in an activity) in PE lessons. Although there is still little
109 evidence in PE, a growing body of research (Curran & Standage, 2017; Vasconcellos et
110 al., 2020) has revealed positive associations between students' perceptions of
111 controlling styles from their teacher and their BPN frustration, controlled motivation,
112 amotivation, and several maladaptive consequences, including oppositional defiance
113 towards the PE teacher (i.e., a defensive and compensatory way by the students to do
114 the opposite of what the teachers expect; Haerens et al., 2015).

115 However, it is worth noting that the distinction between the internal and external
116 faces of controlling behaviors from PE teachers has been rarely studied in PE. In this
117 vein, one of the only two existing studies showed that while both controlling practices
118 were strongly related to each other ($r = .54$), an empirical distinction between perceived
119 internally and externally controlling teaching were identified as well. In particular, five

120 different profiles of perceived controlling teaching style were identified, with two
121 profiles being characterized by either high or low levels of externally and internally
122 controlling behaviors and other profiles displaying high or low levels of one of the types
123 of controlling teaching behaviors. These results support that, although PE teachers may
124 use both controlling practices in their instructional practice, it is also possible that only
125 one of them predominates in their lessons. In addition, these only two previous existing
126 studies also showed that, although both faces of controlling teaching behavior were
127 positively related to BPN frustration, controlled motivation, and amotivation, internally
128 controlling behaviors were more detrimental to students' motivational outcomes
129 (Authors, xxxx; De Meyer et al., 2016). Further research is, therefore, required to
130 examine the consequences of these two faces of the controlling teaching style in boys
131 and girls.

132 **Gender Differences in Students' Motivational Processes Involved in PE Lessons**

133 Previous SDT-research, conducted in the context of PE, has found inconsistent
134 results regarding the gender differences in students' perceptions of teachers' controlling
135 style and students' motivational experiences. For instance, some prior studies reported
136 no differences between boys and girls in perceptions of controlling teaching (Behzadnia
137 et al., 2018; Koka & Sildala, 2018), BPN frustration (Haerens et al., 2015), controlled
138 motivation and amotivation (Behzadnia et al., 2018; Haerens et al., 2015; Ntoumanis,
139 2005). Conversely, other studies revealed that boys reported higher scores in controlling
140 teaching (Bartholomew et al., 2018; Burgueño & Medina-Casaubón, 2021; De Meyer et
141 al., 2014; Haerens et al., 2015), BPN frustration (Bartholomew et al., 2018; Behzadnia
142 et al., 2018), controlled motivation (Burgueño & Medina-Casaubón, 2021; De Meyer et
143 al., 2014; Ntoumanis, 2005), and oppositional defiance (Haerens et al., 2015). Girls, in
144 contrast, in other studies, reported higher values in amotivation (De Meyer et al., 2016;

145 Johnson et al., 2011; Ntoumanis, 2005; Shen, 2015) and, more specifically, in
146 competence need frustration (Burgueño & Medina-Casaubón, 2021).

147 Yet, SDT-based research examining the relationship of teachers' controlling
148 styles on motivational outcomes, considering the differentiated role of gender in this
149 motivational process, is relatively scarce in PE. The Koka and Sildala's (2018) study
150 was the only one found that analyzed the association of controlling behaviors from PE
151 teachers and students' amotivation in both boys and girls. Although this research did not
152 consider the external and internal faces of controlling teaching (De Meyer et al., 2014),
153 and only partially examined the dark side of motivation described by SDT (Ryan &
154 Deci, 2017), it revealed that girls obtained a greater predictive effect in the relationships
155 of two controlling teaching behaviors (i.e., perceive and conditional regard and
156 intimidating behaviors) to amotivation, while boys showed a higher predictive capacity
157 in the association of teachers' controlling use of praise and amotivation (Koka &
158 Sildala, 2018). Therefore, this previous study suggests that PE teachers' controlling
159 behaviors could impact the motivational process of boys and girls differently.

160 However, there are no studies that have examined the extent to which internally
161 and externally controlling behaviors from teachers may trigger different motivational
162 processes between female and male students in the PE setting. From a theoretical
163 perspective, examining the gender differences in the relationship between the variables
164 integrated in the dark side of motivation, postulated by SDT, can help to better
165 understand their functioning in boys and girls in PE. To obtain a better insight into the
166 detrimental effects of internally and externally controlling teaching behaviors on boys'
167 and girls' motivational experiences in PE, additional research is, therefore, required.
168 This might help PE teachers to refrain from using controlling behaviors when teaching
169 students, from a gender perspective.

170 **Objectives and Hypotheses**

171 To fill these gaps in the literature, the aim of this research is twofold. First, this
172 study aims to identify any gender differences in students' perceptions of internally and
173 externally controlling behaviors from PE teachers, the frustration of the three BPN,
174 controlled motivation, amotivation, and oppositional defiance in PE. Due to inconsistent
175 results regarding gender differences in SDT-related variables (i.e., internally and
176 externally controlling behaviors, need frustration, controlled motivation, and
177 amotivation), no hypothesis was formulated. Next, this study also aims to examine the
178 extent to which internally and externally controlling teaching behaviors may have
179 different effects on the frustration of each BPN (i.e., autonomy, competence, and
180 relatedness), controlled motivation, amotivation, and oppositional defiance between
181 girls and boys in PE lessons. We hypothesize that internally controlling behaviors will
182 be more detrimental to students' motivational outcomes than externally controlling
183 behaviors (Authors, xxxx; De Meyer et al., 2016). In line with prior research (Koka &
184 Sildala, 2018), we also postulate that the relationships of internally and externally
185 controlling behaviors on students' frustration of each BPN, controlled motivation,
186 amotivation, and oppositional defiance towards their teacher in PE lessons would be
187 different in boys and girls.

188 **Methods**

189 **Participants and Setting**

190 A convenience sample of 1153 coeducational secondary school students from
191 five of the eight secondary schools in [details have been removed for peer review]
192 (Spain) were invited to voluntarily participate in this cross-sectional study. After
193 obtaining written informed consent from both adolescents and their parents, and
194 removing invalid data (valid response rate: 97%), the final sample consisted of 1118

195 secondary school students ($M_{age}=14.11$, $SD=1.50$; 50.9% girls), who answered different
196 validated questionnaires in PE. A paper-and-pencil survey was administered by the
197 researchers in a quiet classroom environment without the presence of the PE teacher.
198 The approximate time to complete the questionnaire was 15-20 minutes. Importantly,
199 students' responses regarding internally and externally controlling behaviors were based
200 on nine different PE teachers (eight men and one woman), in a range of approximately
201 125 students per teacher. Class size ranged from 20 to 32 students per class ($M=25$,
202 $SD=2.85$). All students received two 50-minute coeducational lessons of PE per week.
203 PE is a compulsory subject for all secondary school students in Spain. Generally, the PE
204 teacher's annual program contains between 6 and 8 different teaching units per year.
205 These teaching units correspond to different types of content (i.e., individual sports,
206 cooperative games, outdoor activities, etc.), which are collected in the PE curriculum.
207 Ethical approval for this study was obtained from the Ethics Committee of [details have
208 been removed for peer review].

209 **Instruments**

210 Students completed a paper-and-pencil survey measuring different SDT-related
211 variables in the context of PE (i.e., internally and externally controlling teaching
212 behaviors, BPN frustration, controlled motivation, amotivation, and oppositional
213 defiance). Unless otherwise noted, students were asked to rate their agreement with the
214 items on a 5-point Likert scale ranging from 1 ("strongly disagree") to 5 ("strongly
215 agree").

216 ***Internally and externally controlling teaching behaviors***

217 Students' perceptions of internally and externally controlling teaching behaviors
218 from the PE teacher were assessed using the Spanish version (Authors, xxxx) of a
219 previously questionnaire developed by De Meyer et al. (2016). The stem "In PE classes,

220 my teacher...” was followed by 8 items that assessed: internally controlling behaviors
221 (four items; e.g., “Pays less attention to me when I disappoint him/her”) and externally
222 controlling behaviors (four items; e.g., “Yells when I am not doing what (s)he wants me
223 to do”). In this study, the confirmatory factor analysis (CFA) showed a good fit to the
224 data ($\chi^2 [19] = 76.29, p < .001$; CFI = .976; TLI = .966; RMSEA = .078), and the
225 Cronbach alphas for internally and externally controlling behaviors were .81 and .93,
226 respectively.

227 ***Basic psychological need frustration***

228 Students’ perceptions of the frustration of the three BPN in PE were assessed
229 using the Spanish version (Zamarripa et al., 2020) of the Basic Psychological Need
230 Satisfaction and Frustration Scale validated in an educational context (BPNSNF) (Chen
231 et al., 2015). This scale includes 12 items (four per need) that assess autonomy
232 frustration (e.g., “I feel pressured to do too many things”), competence frustration (e.g.,
233 “I feel disappointed with many of my performance”), and relatedness frustration (e.g., “I
234 feel that people who are important to me are cold and distant towards me”). In the
235 current study, the CFA showed a good fit to the data ($\chi^2 [51] = 190.641, p < .001$; CFI =
236 .984; TLI = .979; RMSEA = .050), and Cronbach’s alphas for autonomy, relatedness
237 and competence frustration were .85, .89, and .90, respectively.

238 ***Controlled motivation and amotivation***

239 Students' perceptions of controlled motivation and amotivation in PE were
240 assessed using the Spanish version of the Perceived Locus of Causality Scale (PLOC)
241 (Ferriz et al., 2015). From the 24 items of this scale, in this study, we only measured the
242 items (four items per factor) that reflect introjected regulation (e.g., “Because I want the
243 others to think that I’m good”), external regulation (e.g., “So that the teacher won’t yell
244 at me”), and amotivation (e.g., “But I really feel I’m wasting my time in PE”).

245 Following the stem: “I engage in PE lessons...” students were asked to rate each item
246 on a 7-point scale ranging from 1 (“strongly disagree”) to 7 (“strongly agree”). Based
247 on SDT and previous studies in PE (e.g., Haerens et al., 2015), average values of
248 introjected and external regulations were used to calculate a composite variable of
249 controlled motivation. In the present study, the CFA showed a good fit to the data (χ^2
250 [53] = 293.971, $p < .001$; CFI = .971; TLI = .962; RMSEA = .065), and the Cronbach’s
251 alphas for controlled motivation and amotivation were .88 and .92, respectively.

252 ***Oppositional defiance***

253 Students' perceptions of oppositional defiance towards the PE teacher were
254 measured using the Spanish validated version (Authors, yyyy) of a previously scale
255 developed in the PE context (Haerens et al., 2015). The stem “In PE lessons...” was
256 followed by four items that reflected students' tendencies to reject PE teacher’s
257 authority (i.e., oppositional defiance) (e.g., “I sometimes think about completely
258 ignoring what the PE teacher asks me to do”). In the current study, the CFA showed a
259 good fit to the data (χ^2 [2] = 3.199, $p < .05$; CFI = .999; TLI = .996; RMSEA = .023),
260 and the Cronbach’s alpha was .72.

261 **Data Analysis**

262 Prior to the main analyses, CFA and Cronbach's alpha reliability of the study
263 variables were performed. In addition, we also examined discriminant validity between
264 internally and externally controlling behaviors via the heterotrait-monotrait (HTMT)
265 ratio of correlations (Henseler et al., 2015), which is acceptable with values under .90,
266 and via the Fornell and Larcker's (1981) criterion, which is acceptable when square root
267 of the average variance extracted (AVE) for a target variable is greater than its
268 correlations among other variables. Regarding the first aim, a multigroup (i.e., boys and
269 girls) analysis was performed to determine if the measurement model was invariant

270 across gender. First, the measurement model for each group (i.e., boys and girls) was
271 conducted, verifying that it fit well to the data. Second, configural, metric (i.e., factor
272 loadings), strong (i.e., factor loadings and intercepts), and strict (i.e., factor loadings,
273 intercepts, and uniquenesses) models of invariance were performed (Putnick &
274 Bornstein, 2016). Each model was compared to the previous model by considering
275 changes in the fit indices (Δ). Greater decreases than .010 in the comparative fit index
276 (CFI) and in the Tucker-Lewis Index (TLI), and greater increases than .015 in the root
277 mean square error of approximation (RMSEA) show a lack of invariance (Putnick &
278 Bornstein, 2016). Third, only after obtaining a strong invariance in the multigroup
279 model, latent mean differences between gender were compared. Consistent with Kline
280 (2016), to compare latent mean between genders, the boys' group latent mean was
281 constrained to 0 and the latent means of the girls' group was free to estimate. To
282 determine if there was a statistical significance between the latent means of boys and
283 girls, the z statistic was used.

284 Regarding the second aim, to investigate gender differences in the relationship
285 between internally and externally controlling teaching styles and SDT dark-side
286 variables in PE, a multigroup structural equation modeling (SEM) was conducted. To
287 evaluate the model fit, the CFI, TLI, and RMSEA were selected. Higher values of .90
288 and .95 for CFI and TLI indicate good and excellent fit, respectively, whereas values of
289 .08 and .06 or less for RMSEA indicate adequate and excellent fit, respectively (Marsh
290 et al., 2004). In addition, point estimates and the 95% bias-corrected bootstrap
291 confidence intervals (95% CI_{BC}) with 5000 bootstrap samples were calculated and
292 reported for each of the proposed direct and indirect pathways (Hayes, 2013). Finally,
293 the standardized regression weights of direct effects, specific indirect effects, total
294 indirect effects, and explained variance (R^2) were reported. All models (i.e., CFA,

295 measurement invariance, and SEM) were conducted using the maximum likelihood
296 (ML) estimator. Analyses were carried out using the statistical programs SPSS v.25 and
297 Mplus v8.0.

298 **Results**

299 **Preliminary Results**

300 Table 1 shows HTMT values less than .85 between internally and externally
301 controlling behaviors in boys and girls. Additionally, scores regarding square root of the
302 AVE were higher than the correlation in question in boys and girls. Taken together,
303 these results gathered evidence supporting discriminant validity between internally and
304 externally controlling behaviors.

305

306 <PLEASE, INSEr TABLE 1 ABOUT HERE>

307 The measurement model of the study variables showed acceptable fit to the data
308 both in boys ($\chi^2 = (630, n = 549) = 1886.324, p < .001$; CFI = .905; TLI = .901;
309 RMSEA = .060; 90% CI = .057 – .063) and girls ($\chi^2 = (630, n = 569) = 1676.687, p <$
310 $.001$; CFI = .932; TLI = .921; RMSEA = .054; 90% CI = .051 – .057).

311 Subsequently, multigroup analysis of invariance revealed that the model was invariant
312 across gender since invariance assumptions were meet (see Table 2). Particularly, all
313 measurement invariance models indicated acceptable fit indices and none of the four
314 steps fell below the recommended guidelines (Δ CFI and Δ TLI $> .010$; Δ RMSEA \geq
315 $.015$).

316 <PLEASE, INSEr TABLE 2 ABOUT HERE>

317 **Gender Differences in Study Variables**

318 Based on the establishment of the full strong invariance across gender, we can
319 compare the latent mean differences between boys and girls in study variables. As

320 observed on the left part of Table 3, findings of the latent mean comparisons between
321 genders showed girls obtained significantly higher scores than boys in autonomy need
322 frustration, competence need frustration, controlled motivation, and amotivation. No
323 significant differences in students' perceptions of internally and externally controlling
324 teaching style, in relatedness need frustration, nor in oppositional defiance were found.

325 <PLEASE, INSERT TABLE 3 ABOUT HERE>

326 **Gender Differences in the Associations of Internally and Externally Controlling** 327 **Behaviors on Students' Motivational Outcomes**

328 A multigroup SEM including indirect paths from internally and externally
329 controlling behaviors, through the frustration of the three BPN, toward controlled
330 motivation, amotivation, and oppositional defiance, was estimated, displaying good fit
331 to the data (χ^2 (1328, n = 1118; 549 boys) = 4132.75, p <.001; CFI = .903; TLI = .900;
332 RMSEA = .061; 90% CI = .059 – .064). Additionally, a direct path from internally and
333 externally controlling behaviors to oppositional defiance was included in that model
334 after observed high modification indices. All these direct and indirect effects and their
335 bias-corrected bootstrap confidence intervals are reported in Table 4, and are shown
336 graphically in Figure 1.

337 <PLEASE, INSERT FIGURE 1 ABOUT HERE>

338 As observed in Figure 1, the independent variables of the model (i.e., internally
339 and externally controlling behaviors) were positively correlated with each other in both
340 genders. Internally controlling behaviors positively predicted autonomy, competence,
341 relatedness frustration, and oppositional defiance for both girls and boys. Importantly,
342 all these direct effects were higher for girls. In contrast, externally controlling behaviors
343 positively predicted autonomy, competence, and relatedness frustration only for boys,
344 and oppositional defiance only for girls. The relationships between BPN frustration and

345 controlled motivation, amotivation, and oppositional defiance, were slightly different
346 between boys and girls. Autonomy frustration positively predicted amotivation in both
347 genders. Yet, only for girls, autonomy frustration positively predicted controlled
348 motivation. In addition, competence frustration positively predicted controlled
349 motivation and amotivation in boys, but only positively predicted controlled motivation
350 in girls. Relatedness frustration positively predicted controlled motivation in boys and
351 amotivation in girls. Finally, competence frustration positively predicted oppositional
352 defiance only for boys.

353 <PLEASE, INSER TABLE 4 ABOUT HERE>

354 With regard to indirect effects, internally controlling behaviors displayed
355 indirect effects on controlled motivation through autonomy and competence frustration
356 in girls. Yet, these indirect effects were not found for boys. In addition, in both genders,
357 no indirect effects were found between externally controlling teaching style and
358 controlled motivation. Moreover, internally controlling behaviors displayed indirect
359 effects on amotivation through autonomy frustration in both genders, and through
360 competence frustration only for boys. As occurred with controlled motivation, no
361 indirect effects were found between externally controlling teaching style and
362 amotivation in both genders. Finally, no indirect effects were found between internally
363 and externally controlling style and oppositional defiance in both genders.

364 Discussion

365 The purpose of this research was twofold. Grounded in SDT, the first of them
366 was to identify any gender differences in students' perceptions of internally and
367 externally controlling behaviors from their PE teacher, the frustration of the three BPN,
368 controlled motivation, amotivation, and oppositional defiance in PE. The second and
369 main objective of this study was to examine the differentiated role that internally and

370 externally controlling behaviors play on SDT-related variables between girls and boys
371 in PE. The main findings of this study revealed that 1) while no gender differences in
372 students' perceptions of internally and externally controlling behaviors were found, the
373 consequences of using both demotivating styles were differently associated in boys and
374 girls; 2) internally controlling behaviors were more detrimental to maladaptive
375 motivational outcomes, especially in girls; 3) although externally controlling behaviors
376 seem to have relatively less detrimental direct effects on students' need frustration, it is
377 important that PE teachers avoid these practices in boys; 4) autonomy frustration was
378 the most closely and positively BPN related to controlled motivation and amotivation in
379 girls, while competence frustration was in boys; and 5) students' tendency to oppose the
380 teacher's authority was a more direct outcome of perceiving controlling behaviors,
381 especially internally controlling behaviors.

382 Regarding the first objective, our results showed no gender differences in
383 students' perceptions of internally and externally controlling behaviors from the PE
384 teachers. However, girls reported significantly higher perceptions of autonomy and
385 competence frustration, controlled motivation, and amotivation than boys. Consistent
386 with our results, Koka and Sildala (2018) found no gender differences in controlling
387 teaching behaviors, but higher values of amotivation were perceived by girls. Yet, with
388 the exception of the study of Koka and Sildala (2018), our results are not completely in
389 line with the few existing previous studies in PE. Contrary to our findings,
390 Bartholomew et al. (2018), De Meyer et al. (2016), and Haerens et al. (2015) reported
391 that boys perceived significantly higher values in controlling teaching behaviors than
392 girls. Nevertheless, it should be noted that all the aforementioned studies, with the only
393 exception of De Meyer et al. (2016), had either measured controlling behaviors from PE
394 teachers in an undifferentiated way or had focused on one particular feature of

395 controlling style (i.e., externally controlling behaviors or internally controlling
396 behaviors). Further qualitative studies are required to find out more about why some
397 studies found gender differences in students' perceptions of controlling behaviors from
398 their PE teacher and others not. Contrary to our results, Burgueño and Medina-
399 Casaubón (2020), De Meyer et al. (2016), and Haerens et al. (2015) reported that boys
400 perceived significantly higher values in controlled motivation, while Bartholomew et al.
401 (2018) showed that girls perceived less need frustration and amotivation than boys in
402 PE. One finding that was common among most of the previous studies (De Meyer et al.,
403 2016; Haerens et al., 2015; Koka & Sildala, 2018) and the present research was that
404 girls reported significantly higher values in amotivation than boys in PE. A possible
405 explanation of these findings could be that girls, compared to boys, usually perceive
406 lower values of competence (Mitchell et al., 2015), provide a lower value for the tasks,
407 and have less interest in PE activities (Shen, 2015), which are factors closely linked
408 with the concept of amotivation proposed by SDT (Ryan & Deci, 2017).

409 Regarding the second aim, our results are consistent with previous literature in
410 the context of PE, indicating that the exposure to controlling teaching environments is
411 associated with experiences of need frustration among students which, in turn, relates to
412 less self-determined forms of motivation and maladaptive outcomes (Bartholomew et
413 al., 2018; Behzadnia et al., 2018; Haerens et al., 2015). It must be noted that although
414 both controlling practices were strongly related to each other in this study ($r = .64$), a
415 distinction between perceived internally and externally controlling teaching were found
416 across evidence of discriminant validity. Consistent with De Meyer et al. (2016), this
417 result suggests that although some teachers may use both controlling practices in their
418 instructional practice, others use only one of the two controlling behaviors
419 predominantly. Perhaps internally controlling behaviors could emerge in PE teachers

420 when externally controlling behaviors do not work with students and, therefore, it is
421 common for some PE teachers to use them in combination. Moreover, our results are in
422 line with a previous study conducted by De Meyer et al. (2016), which showed that,
423 although both faces of controlling style are associated with students' maladaptive
424 outcomes in PE lessons, internally controlling behaviors from PE teachers are more
425 detrimental. A possible justification would rest on the fact that when students perceive
426 that their teacher more frequently adopts covert ways of internally controlling behaviors
427 (e.g., guilt-induction, withdrawal of attention, or facial and verbal expressions of
428 disappointment) than overt ways of externally controlling behaviors (e.g., yelling,
429 threats or coercive language), they will likely feel more pressured to participate in the
430 lessons (i.e., autonomy frustration), more inefficient to perform the activities (i.e.,
431 competence frustration), and more socially excluded from their peer group (i.e.,
432 relatedness frustration).

433 With regard to gender inspection, consistent with our research, Koka and Sildala
434 (2018) also found that the different faces of teachers' controlling behaviors were related
435 to girls' and boys' amotivation differently. Several explanations could be given to
436 explain these gender differences. Firstly, as boys reported more disruptive behaviors
437 than girls in PE lessons (Garn et al., 2011; Granero-Gallegos et al., 2020), externally
438 controlling behaviors provided by PE teachers to all class members could be more
439 internalized in boys and, consequently, lead to the frustration of their BPN. However,
440 girls may interpret externally controlling strategies in a relatively less straightforward
441 manner because they know that these practices are particularly related to boys'
442 misbehavior. This justification should be interpreted with caution because externally
443 controlling behaviors were also significantly and positively related to oppositional
444 defiance in girls. Secondly, the fact that PE teachers interact more with boys than girls

445 (Mitchell et al., 2015; Nicaise et al., 2007) could explain those internally controlling
446 behaviors may be slightly more detrimental to girls. Withdrawal of attention from PE
447 teachers could mean that girls feel more ignored, invisible, and unvalued compared to
448 boys (Mitchell et al., 2015; Shen, 2015). Given gender differences in personality traits
449 could play an important role in girls' and boys' perceptions of internally and externally
450 controlling strategies (Lippa, 2010; Thomas et al., 2020), future studies should include
451 students' personality traits in the hypothetical model.

452 Furthermore, the findings of this research also align with the previous studies in
453 the PE setting (Bartholomew et al., 2018; Behzadnia et al., 2018; Haerens et al., 2015),
454 in the sense that the students' perception of BPN frustration was primarily related to
455 controlled motivation and amotivation, although gender differences were firstly
456 reported. Particularly, in our study, autonomy frustration was the most closely and
457 positively BPN related to controlled motivation and amotivation in girls, while
458 competence frustration was in boys. A plausible explanation might lie in the fact that
459 boys and girls have distinct conceptualizations that differentially guide their
460 motivational processes in PE (Corr et al., 2019; Garn et al., 2011). While boys are more
461 likely to understand PE as a subject to display competence and physical superiority,
462 girls tend to conceive PE as a choice for learning and socialization (Garn et al., 2011).
463 This would suggest that when boys perceived their competence as being frustrated, they
464 would participate in PE lessons by controlled reasons (e.g., getting good grades) or for
465 any intrinsic or extrinsic reason (e.g., not valuing the subject). Instead, girls would
466 adopt behaviors guided by controlled or amotivated reasons in the PE lesson, when they
467 perceive autonomy as frustrated.

468 In addition, our results are in line with previous studies in the PE context
469 (Haerens et al., 2015), demonstrating that students' tendency to oppose the teacher's

470 authority was a more direct outcome of perceiving controlling teaching behaviors,
471 especially the internal face. There are several plausible explanations for these findings.
472 Firstly, teachers' externally controlling behaviors were only associated with
473 oppositional defiance in girls, suggesting that they were more likely to rebel against
474 their PE teacher when (s)he makes use of a controlling language, threats, and shouts.
475 Instead, boys seem to have well-normalized externally controlling teaching behaviors in
476 PE lessons, which could explain why this type of controlling strategies was not related
477 to oppositional defiance in boys. Indeed, boys could interpret that the teachers who used
478 externally controlling behaviors are more involved because they make greater efforts
479 into the lesson and are more engaged with the teaching and learning process. Secondly,
480 internally controlling behaviors were more strongly associated with oppositional
481 defiance both in boys and girls. Maybe as internally controlling behaviors (e.g.,
482 withdrawal of attention, facial or verbal display of deception, or being less friendly) are
483 less normalized in PE lessons, they could have a greater tendency to oppose their
484 teacher's authority by feeling personally rejected or disapproved by their teacher.
485 Although this direct relationship would suppose an impulsive desire to oppose the
486 teacher in boys and girls, boys also developed a more reflective process via need
487 frustration. This process would imply that, particularly, boys decide to rebel against
488 their teacher, in a relatively conscious way, after being exposed for a long time of
489 internally controlling practices, entailing an accumulation of autonomy frustration
490 experiences.

491 **Implications for Practice**

492 The results from the present research suggest that when PE teachers adopt
493 externally and, more particularly, internally controlling behaviors, their students' will
494 experience a frustration of their BPN, which, in turn, will be associated with

495 maladaptive outcomes such as controlled motivation, amotivation, and oppositional
496 defiance. In light of our results, there is a primary need to develop continuous training
497 programs that help in-service teachers reduce their internally and externally controlling
498 practices to their students during PE lessons. Given previous studies have suggested that
499 need-supportive behaviors do not act as a buffer against the detrimental effects of this
500 type of controlling behaviors (Haerens et al., 2018), it is important to make teachers
501 aware of the detrimental effects of controlling practices on students' motivational
502 experiences to reduce or avoid them. Some of the internally and externally controlling
503 behaviors that can be commonly observed in PE are identified below so that teachers
504 can avoid their use. The teacher who uses externally controlling behaviors adopt
505 strategies such as: 1) punishment for misbehavior, 2) threatening to give bad grades or
506 sanctions when the proposed tasks are not performed well, 3) threatening with a more
507 monotonous or boring type of activities, 4) yelling, and 5) using a controlling language
508 with phrases such as "you should" and "you must" (De Meyer et al., 2016). The teacher
509 who uses externally controlling behaviors adopt strategies such as: 1) showing an
510 apathetic or distant attitude, 2) withdrawal of attention, 3) making the student feel
511 guilty, and 4) showing visible feelings of disappointment (De Meyer et al., 2016). In
512 addition, it seems also recommendable that teachers reflect deeply upon how their
513 teaching behaviors might be perceived by students. In this sense, although teachers do
514 not intentionally use neither internally nor externally controlling behaviors, they might
515 be perceived as controlling by students, fostering maladaptive motivational experiences
516 in PE lessons. To illustrate, there are class dynamics such as the creation of groups for
517 an activity, where the teacher can use different controlling strategies. For example, the
518 PE teacher establishes a deadline to have made four groups and counts down aloud
519 (externally controlling behaviors), while students are creating the groups, making them

520 feel their autonomy frustrated and their behavior motivated in a controlled way.
521 Similarly, the PE teacher does not assign some students to any group because they
522 perceive that they are not going to work. By ignoring them and withdrawing their
523 attention (internally controlling behaviors), these students would likely feel their BPNs
524 as more frustrated.

525 Considering gender differences in the association of controlling behaviors and
526 maladaptive outcomes, PE teachers should reduce internally controlling behaviors in
527 both genders, but particularly in girls, and externally controlling behaviors in boys.
528 Understanding the male and female students' motivational processes involved in PE
529 lessons could help teachers not only to refrain from using controlling strategies,
530 especially the strategies that are most detrimental to each gender, but also to be more
531 need-supportive toward boys and girls through the use of teaching behaviors such as the
532 use of an informational and noncontrolling language, the creation of opportunities for
533 students input and initiative, enough time for self-paced learning, and the
534 acknowledgment of expression of negative affect in the PE lesson (Reeve, 2009).

535 **Limitations and Directions for Future Research**

536 It should be noted that this research has a number of limitations. Firstly, the use
537 of a non-probabilistic sampling method suggests that the results should be taken with
538 caution and, therefore, these findings cannot be generalized. Future studies are, thus,
539 needed to investigate whether the relationships of controlling teaching behaviors with
540 boys' and girls' motivational experiences would vary across other educational levels, as
541 well as other social and cultural contexts. A second limitation may be the only use of a
542 self-reported questionnaire to measure internally and externally controlling behaviors
543 from PE teachers. Complementary observational measures to self-reported
544 questionnaires should be required to provide a better insight into the relationships of the

545 two faces of teachers' controlling behaviors with male and female students' bright (i.e.,
546 BPN satisfaction, autonomous motivation) and dark (i.e., BPN frustration, controlled
547 motivation and amotivation) motivational experiences in PE (De Meyer et al., 2014). As
548 a third limitation, this research relied on the theoretical distinction between the internal
549 and external faces of teachers' controlling behaviors proposed by SDT (Reeve, 2009;
550 Ryan, 1982; Ryan & Deci, 2019); there might be, however, another approaches to
551 measuring teachers' controlling behaviors (e.g., Koka & Sildala, 2018). A fourth
552 limitation would be that, although the hypothetical model was based on the SDT's
553 tenets, causal inferences cannot be made given the cross-sectional nature of this study.
554 Further longitudinal and experimental research is required to confirm the direction of
555 causality between these SDT-related variables.

556 **Conclusions**

557 This study adds evidence to a very small body of research in the PE field,
558 demonstrating that, although no gender differences in students' perceptions of internally
559 and externally controlling behaviors were found, the consequences of using both
560 controlling behaviors could differently affect boys' and girls' maladaptive motivational
561 experiences in PE. Taking together, the results of this study suggested that, although
562 both faces of controlling teaching style were related to students' maladaptive
563 motivational experiences in PE, the internal face of controlling style was more strongly
564 associated with BPN frustration, controlled motivation, amotivation, and oppositional
565 defiance, particularly in girls. Results also suggest that, although externally controlling
566 behaviors seem to have relatively less detrimental direct effects on students' need
567 frustration, it is important that PE teachers avoid these practices in boys. Broadly
568 speaking, the findings recommend that both initial education programs for preservice
569 PE teachers and continuous professional development programs for in-service teachers

570 should train teachers to become less controlling towards their students (Reeve, 2009).
571 Indeed, these findings suggest that PE teachers should be aware of the risks associated
572 with internally and externally controlling behaviors on boys' and girls' maladaptive
573 motivational experiences in PE lessons.

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Table 1*Discriminant validity between internally and externally controlling behaviors*

	Girls				Boys			
	AVE	$\sqrt{\text{AVE}}$	1	2	AVE	$\sqrt{\text{AVE}}$	1	2
1. Internally controlling behaviors	.54	.73	-	.64	.64	.80	-	.74
2. Externally controlling behaviors	.61	.78	.73	-	.67	.82	.77	-

Note: AVE = Average variance extracted; Numbers above diagonal display correlations, while bold numbers below diagonal show heterotrait-monotrait (HTMT) ratio of correlations

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Table 2*Multigroup invariance across gender of the measurement model*

Model	χ^2 (df)	CFI	TLI	RMSEA [90% CI]
M1. Configural invariance	3563.32 (1260)	0.920	0.911	0.057 [0.055-0.060]
M2. Weak invariance	3636.24 (1290)	0.919	0.911	0.057 [0.055-0.059]
M3. Strong invariance	3686.50 (1320)	0.916	0.912	0.057 [0.055-0.059]
M4. Strict invariance	4071.35 (1360)	0.907	0.903	0.060 [0.058-0.062]

Note: χ^2 =Scaled chi-square test of exact fit; df=Degrees of freedom; CFI=Comparative fit index; TLI=Tucker-Lewis index; RMSEA=Root mean square error of approximation; RMSEA [90% CI]=90% Confidence interval of the RMSEA; CM=Comparison model; Δ =Change in fit information relative to the CM.

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782 **Table 3**783 *Latent mean differences and latent correlations between study variables by gender*

	<i>Mean boys</i> (<i>n</i> = 549)	<i>Mean girls</i> (<i>n</i> = 569)	<i>Difference</i>	<i>z-value</i>	<i>p</i>	1	2	3	4	5	6	7	8
1. Internally controlling	1.98	1.99	-0.01	1.27	.202	-	.64	.39	.32	.30	.34	.38	.61
2. Externally controlling	2.09	2.17	-0.08	0.28	.776	.74	-	.33	.27	.29	.29	.25	.49
3. Autonomy frustration	2.31	2.56	-0.25	3.70***	.001	.55	.45	-	.47	.46	.24	.43	.36
4. Competence frustration	1.76	2.16	-0.40	6.04***	.001	.46	.39	.67	-	.54	.31	.42	.38
5. Relatedness frustration	1.52	1.58	-0.06	1.00	.313	.34	.29	.49	.60	-	.27	.37	.34
6. Controlled motivation	3.31	3.73	-0.42	2.58**	.010	.41	.37	.45	.44	.37	-	.26	.36
7. Amotivation	1.79	2.37	-0.58	6.34***	.001	.57	.49	.65	.54	.46	.37	-	.48
8. Oppositional defiance	1.86	1.97	-0.11	1.61	.107	.60	.57	.41	.39	.25	.31	.43	-

Note: Latent correlations for boys are shown above the diagonal and correlations for girls are shown below the diagonal. All correlations were significant at the level $p < .001$.

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Table 4

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Direct and indirect effect of internally and externally controlling behaviors and autonomy, competence, and relatedness frustration on motivational outcomes

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	β - coefficient (SE)		<i>p</i> -values		[95% CI _{BC}]	
	Boys	Girls	Boys	Girls	Boys	Girls
Direct effects on autonomy frustration						
Internally controlling	.31**(.07)	.48**(.07)	<.001	<.001	[.18, .44]	[.35, .61]
Externally controlling	.14†(.07)	.12 (.07)	.058	.106	[.01, .25]	[-.01, .24]
Direct effects on competence frustration						
Internally controlling	.27**(.07)	.41**(.07)	<.001	<.001	[.14, .39]	[.27, .54]
Externally controlling	.12* (.07)	.12 (.08)	.067	.115	[.01, .24]	[-.01, .26]
Direct effects on relatedness frustration						
Internally controlling	.20**(.07)	.29**(.07)	.009	.001	[.07, .33]	[.14, .42]
Externally controlling	.16* (.07)	.08 (.09)	.029	.347	[.04, .29]	[-.06, .23]
Direct effects on controlled motivation						
Autonomy frustration	.08 (.07)	.26* (.12)	.267	.032	[-.04, .19]	[.10, .40]
Competence frustration	.21**(.06)	.22†(.16)	.003	.065	[.09, .32]	[.04, .42]
Relatedness frustration	.14* (.06)	.12 (.09)	.043	.209	[.02, .24]	[-.02, .24]
Direct effects on amotivation						
Autonomy frustration	.27**(.07)	.50**(.11)	<.001	<.001	[.14, .39]	[.35, .63]
Competence frustration	.25**(.07)	.14 (.15)	.001	.358	[.12, .36]	[-.02, .32]
Relatedness frustration	.11 (.07)	.12†(.08)	.153	.068	[-.01, .24]	[.02, .25]
Direct effects on oppositional defiance						
Internally controlling	.59**(.10)	.54**(.09)	<.001	<.001	[.42, .75]	[.38, .71]
Externally controlling	.03 (.09)	.18* (.09)	.717	.049	[-.11, .18]	[.03, .32]
Autonomy frustration	.01 (.07)	-.02 (.11)	.883	.819	[-.11, .13]	[-.18, .11]
Competence frustration	.15†(.08)	.12 (.16)	.074	.459	[.03, .28]	[-.06, .30]
Relatedness frustration	.07 (.08)	-.04 (.09)	.386	.603	[-.06, .21]	[-.18, .08]
Indirect effects of internally controlling style on controlled motivation						
Total indirect	.10**(.03)	.25**(.05)	.001	<.001	[.05, .16]	[.17, .33]
Autonomy frustration	.02 (.02)	.13* (.06)	.316	.042	[-.01, .06]	[.04, .21]
Competence frustration	.06 (.02)	.09†(.08)	.052	.253	[-.01, .10]	[.01, .19]
Relatedness frustration	.02 (.02)	.03 (.03)	.162	.274	[-.01, .06]	[-.01, .08]
Indirect effects of externally controlling style on controlled motivation						
Total indirect	.05* (.02)	.07 (.04)	.031	.094	[.01, .10]	[-.01, .14]
Autonomy frustration	.01 (.01)	.03 (.02)	.373	.224	[-.01, .03]	[-.01, .07]
Competence frustration	.02 (.01)	.03 (.08)	.136	.337	[-.01, .05]	[-.01, .07]
Relatedness frustration	.02 (.01)	.01 (.01)	.155	.502	[-.01, .05]	[-.01, .03]
Indirect effects of internally controlling style on amotivation						
Total indirect	.17**(.04)	.33**(.06)	<.001	<.001	[.10, .25]	[.24, .42]
Autonomy frustration	.08* (.03)	.24**(.07)	.020	.001	[.03, .15]	[.14, .35]
Competence frustration	.07* (.02)	.06 (.07)	.035	.437	[.02, .12]	[-.01, .14]
Relatedness frustration	.02 (.02)	.03 (.03)	.303	.226	[-.01, .06]	[-.01, .08]
Indirect effects of externally controlling style on amotivation						
Total indirect	.08* (.03)	.09 (.05)	.019	.087	[.02, .14]	[-.01, .18]
Autonomy frustration	.03 (.02)	.06 (.04)	.084	.137	[-.01, .07]	[-.01, .12]
Competence frustration	.03 (.02)	.02 (.02)	.114	.518	[-.01, .06]	[-.01, .06]
Relatedness frustration	.02 (.01)	.01 (.01)	.252	.505	[-.01, .04]	[-.01, .04]
Indirect effects of internally controlling style on oppositional defiance						
Total indirect	.06* (.02)	.02 (.03)	.028	.552	[.01, .10]	[-.04, .07]
Autonomy frustration	.01 (.02)	-.01 (.05)	.886	.809	[-.04, .04]	[-.09, .05]
Competence frustration	.04 (.02)	.04 (.07)	.115	.409	[-.01, .08]	[-.02, .12]
Relatedness frustration	.01 (.01)	-.01 (.02)	.425	.610	[-.01, .04]	[-.05, .02]
Indirect effects of externally controlling style on oppositional defiance						
Total indirect	.03 (.02)	.01 (.01)	.110	.638	[-.01, .06]	[-.01, .03]
Autonomy frustration	.01 (.01)	-.01 (.01)	.897	.856	[-.01, .02]	[-.02, .01]
Competence frustration	.01 (.01)	.03 (.02)	.244	.591	[-.01, .04]	[-.01, .05]
Relatedness frustration	.01 (.01)	-.01 (.01)	.462	.740	[-.01, .04]	[-.02, .01]

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Note: 95% CI_{BC} = 95% biased-corrected bootstrap confidence intervals. SE = Standard error. Significant effects are highlighted in bold. ** $p < .01$; * $p < .05$; † $p > .05$ but 95%CI_{BC} but do not contain 0.

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