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Abstract

The purpose of this study was to estimate the main and interaction effects of grouping forms, student gender and ability level on the pleasure experienced in physical education (PE). The participants included 178 secondary school students ($M = 13.17$, $SD = .81$), with 72 students enrolled in a basketball unit and 106 students enrolled in an endurance unit. Seventy-eight students participated in PE in alternating groups (alternating ability-based and mixed ability groups), and 100 students participated in mixed ability classes. Pleasure was assessed using a validated French language 10-item scale. The results indicated a significant main effect of grouping forms on the pleasure experienced in the basketball unit and a small but non-significant effect for endurance. The students in the alternating groups felt more pleasure than those in the mixed ability classes. Considering the importance of pleasure in PE, the alternating groups appear to represent a good solution.

Keywords: gender, physical education, teaching

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19 Effects of Grouping Forms, Student Gender and Ability Level on the Pleasure Experienced in
20 Physical Education

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22 “Pleasure is an exceedingly complex concept” (Booth, 2009, p. 147). There are various
23 definitions of pleasure grounded in different theoretical backgrounds (Booth, 2009; Haye,
24 1995; Kimiecik & Harris, 1996; Pringle, 2010). In this study, the definition and measurement
25 of pleasure are based on Delignières and Perez’s 1998 study. Specifically, the pleasure
26 experienced in an activity unit in physical education (PE) is defined as a pleasant emotional
27 state and a positive emotional response to physical activity.

28 Pleasure is struggling to find its place within school. According to Booth (2009),
29 pleasure is silenced in school. Fun and serious activities appear to be contradictory when
30 referring to the challenges of education; however, it appears that the pleasure of learning is as
31 valuable as the pleasure experienced during play (Haye, 1995, 2011).

32 PE has consistently exhibited ambiguous relationships with the notion of pleasure
33 (Liotard, 1997). Throughout its history, PE has sought to be legitimated in school, and pleasure
34 has been placed in the background (Rintala, 2009). Most PE teachers recognize the value of
35 pleasure in PE; however, few PE teachers agree with the promotion of pleasure as a legitimate
36 educational value. Rather, they value developmental goals and learning as the dominant
37 justifications of PE (Booth, 2009; Pringle, 2010). Wellard (2012) underlined a “fear of fun” in
38 PE (p. 23).

39 We support the idea that PE has educational value because of its ability to promote an
40 increase in intrinsic pleasure (Booth, 2009; Bui-Xuân et al., 2007; Delignières & Garsault,
41 2004; Hawkins, 2008; Pringle, 2010; Rintala, 2009; Twietmeyer, 2012; Wellard, 2012).
42 According to Booth (2009), “pleasure could provide greater coherence to a discipline [PE]

43 grounded in diverse contents, philosophies, theories, methods and agendas” (p. 147). Pleasure
44 is an indicator of intrinsic motivation and a prerequisite for learning (Gagnaire & Lavie, 2007).
45 It is also the key factor in developing sports practice habits (Biddle & Goudas, 1994;
46 Delignières & Garsault, 2004; Dishman, 1990), which is one of the main goals of PE at school
47 (Beasley & Garn, 2013). If we desire students to develop skills and abilities and pursue
48 extracurricular physical activities, it is important to rethink the PE curriculum, develop
49 enjoyable PE lessons and consider pleasure to be a fundamental component of PE (Bui-Xuân
50 et al., 2007; Delignières & Garsault, 2004; Dishman, 1990; Thorburn and MacAllister, 2013;
51 Wellard, 2012). Teachers should encourage students to enjoy the thrill of the game and to feel
52 pleasure in movement (Rintala, 2009). Thus, student-centered pedagogical approaches, such as
53 “Sport Education” (Siedentop, 1994) or “Teaching Game for Understanding” (TGfU) (Bunker
54 and Thorpe, 1982), have gained worldwide popularity in recent years (Griffin & Butler, 2005;
55 Harvey, Kirk, & O’Donovan, 2014). These approaches are centered on PE students’ positive
56 affects and the educational value of play, and they advocate PE that is more relevant and
57 enjoyable. According to Siedentop (1994) and the model of “Sport Education” developed in the
58 early eighties, if student experiences in physical activities are intrinsically pleasant and
59 satisfactory, the development of a physical activity, such as a sport, is promoted.

60 Although some authors have promoted the development of pleasure in PE, few studies
61 have focused on the effects of student or teaching characteristics on the pleasure experienced
62 in PE (Delignières & Perez, 1998; Dudley, Okely, Pearson, Caputi, & Cotton, 2013; Scanlan &
63 Lewthwaite, 1986). The aim of this study was to estimate the effects of student characteristics
64 (i.e., ability level, gender) and grouping forms (i.e., alternating groups, mixed ability classes)
65 on the pleasure experienced in PE.

66 **Effects of student characteristics on the pleasure experienced in PE**

67 Students may have different expectations of PE (i.e., competition, play, conviviality,
68 technical expertise, sports achievement, or body sensations), which determine, in part, their
69 involvement and pleasure in PE (Gagnaire & Lavie, 2010). Gagnaire and Lavie (2010)
70 identified some similarities in students' expectations of PE. All students, regardless of age and
71 gender, expected friendliness, play, and the sharing of emotions in and around actions, and
72 competition was a secondary expectation. However, some gender differences in the pleasure
73 experienced in PE emerged. Although PE was one of the school subjects that students most
74 appreciated (Dudley et al., 2013; Gao, 2009; Pühse, Gerber, Mengisen, Repond, 2005; Spray,
75 Biddle, & Fox, 1999; Terrail, 1992), male students appreciated PE more than their female
76 counterparts (Bramham, 2003; Carroll & Loumidis, 2001; Hill & Cleven, 2005; Sian,
77 Lightbody, Stocks, & Walsh, 1996; Spray et al., 1999; Terrail, 1992; Warrington & Younger,
78 2000). In Garrett's 2004 study, females rarely reported that they experienced pleasure in PE.
79 PE disappointed many female students; they declared they did not have sufficient time to
80 develop their physical abilities or progress in PE (Flintoff & Scraton, 2001). Of note, Dudley
81 et al. (2013) showed little variation in females' and males' enjoyment of PE. Nevertheless, the
82 researchers showed a greater overall decline in females' enjoyment of PE during the first two
83 years of secondary school compared with males' enjoyment (regardless of school type). A
84 student's physical ability level may also affect the pleasure that he/she experiences in PE
85 (Carney, Kwan, Velduizen, Hay, Bray, & Faught, 2012; Carroll & Loumidis, 2001; Fairclough,
86 2006; Hassandra, Goudas, & Chroni, 2003; Luke & Sinclair, 1992; Pühse, et al., 2005). Carroll
87 and Loumidis (2001) identified positive relationships between pleasure and physical self-
88 concept in PE. In Luke and Sinclair's (1992) study, females and males reported that
89 achievement and competency in PE led to a more positive attitude, whereas the lack of
90 competence and achievement led to negative attitudes toward PE. In Switzerland, PE was also
91 a favorite school subject, but students' appreciation depended on their physical self-concept.

92 Indeed, 80% of students with low levels of physical self-concept considered PE to be an
93 unpleasant obligation (Pühse, et al., 2005).

94 **Influence of instructional factors on the pleasure experienced in PE: grouping forms**

95 PE teachers may also influence student motivation and engagement through their
96 attitudes, feedback and organization of learning contexts (Chen, 2001; Chen & Ennis, 2004;
97 Dudley et al., 2013; Hassandra, Goudas, & Chroni, 2003; Rutten, Boen, & Seghers, 2012; Ryan
98 & Deci, 2000). Student grouping is a factor that may impact the pleasure experienced in PE;
99 however, to date, research has not focused on this aspect. Notably, teachers can place students
100 in ability-based groups or mixed ability groups or can alternate different grouping forms.

101 Ability-based and mixed ability groups have some limitations and advantages.
102 According to Haynes et al. (2008), mixed ability classes are more reflective of society and
103 appear to be more beneficial for lower-achieving students. Ability-based groups in PE also have
104 some advantages: they enable greater safety, especially during activities characterized by
105 frequent collisions. Ability-based groups make sense for individualized learning and allow for
106 the creation of a more intimate learning environment, especially for lower-achieving students.

107 Previous studies have primarily focused on the effects of ability-based groups on
108 academic achievement (Chen, Chang, & He, 2003). Ability-based groups in schools, such as in
109 PE, are debated, and studies have obtained conflicting results. According to the meta-analysis
110 of Kulik and Kulik (1982), although some school programs that used ability-based grouping
111 demonstrated only weak effects, other programs greatly assisted students. Gifted, average and
112 low-achieving students benefit from ability-based programs that adjust the curriculum to their
113 ability level. According to some authors (Grossen, 1996; Hutchison, 2003; Kulik & Kulik,
114 1982; Lou et al., 1996; Slavin, 1987), schools should form ability-based groups and ignore the
115 critics of ability-based groups who support the complete elimination of such groups. Other
116 authors have claimed that the implementation of ability-based groups in schools is a mistake.

117 Ability grouping is accompanied by changes in the quantity and quality of instruction according
118 to the group's ability level; thus, the objectives would be even more modest for low-achieving
119 students (Dupriez & Draelants, 2004; Duru-Bellat & Mingat, 1997). In terms of learning
120 opportunities, the lowest-achieving students would be penalized by the implementation of
121 ability-based groups, and the best students would be helped (Cahan, Linchevski, Naama, &
122 Danziger, 1996; Ding & Lehrer, 2004; Grossen, 1996; Haynes et al., 2008; Lleras & Rangel,
123 2009). According to other studies, the effects of ability-based and mixed ability groups would
124 be equivalent (Kulik, 1992; Slavin, 1987, 1990; Wright, Horn, & Sanders, 1997).

125 In addition to studies on the effects of ability-based groups on academic achievement,
126 some studies have examined the effects on students' self-concept. Students' comparison of their
127 academic performance with that of their peers contributes to the development of their academic
128 self-concept (Chen et al., 2003). Marsh and colleagues' studies underlined that attendance at an
129 elitist school or class weakens a student's academic self-concept (but not his/her non-academic
130 self-concept) (Chanal, Marsh, Sarrazin, & Bois, 2005; Marsh, 1987, 2003, 2004; Marsh,
131 Chessor, Craven, & Roche, 1995; Marsh, Kong, & Hau, 2000; Zeidner & Schleyer, 1999). This
132 phenomenon is referred to as the "big-fish-little-pond effect" (BFLPE) and is the result of the
133 upward social comparison that students are exposed to. Few studies have shown the opposite
134 effect, referred to as the "assimilation effect", which describes the stimulation that students can
135 receive via integration in a high ability level group (Abadzi, 1985; Chanal & Sarrazin, 2007).
136 This stimulation can increase their academic self-concept because they know that they belong
137 to the best group. In contrast, the academic self-concept of students who belong to the lowest-
138 achieving groups may decline because of this assimilation effect. According to Chanal and
139 Sarrazin (2007), when the comparison to a group was explicit in PE (selected group of students),
140 the assimilation effect was present, whereas the opposite effect occurred when the comparison
141 was implied (class group).

142 In light of previous studies, it appears important to overcome this dilemma of
143 homogeneity vs. heterogeneity (Dupriez & Draelants, 2004). The goal is to identify a
144 compromise given that both equity without excellence and excellence without equity are
145 unacceptable. The alternation of ability-based and mixed ability groups appears to be the best
146 way to reduce the limits of these two group forms and take advantage of each form (Crahay,
147 2000; Ireson & Hallam, 2001; Slavin, 1987). To date, no study has measured the effects of
148 alternating groups in school and PE. Considering the importance of pleasure in PE, it is
149 important to estimate the effect of grouping forms on pleasure.

150 **Study presentation**

151 Due to the lack of studies on pleasure in PE and grouping form alternations, this study
152 focused on the main and interaction effects of grouping forms (i.e., the alternation of ability-
153 based and mixed ability groups vs. mixed ability classes), student gender and ability level (i.e.,
154 low, average, or high) on the pleasure experienced in two different activity units (endurance
155 and basketball) in PE. The research questions were as follows: Was the pleasure experienced
156 in endurance and basketball units similar for males and females and for students with low,
157 average, and high ability levels? Was the pleasure experienced in PE influenced by grouping
158 forms? Did the females (or males) in alternating groups (alternating ability-based and mixed
159 ability groups) feel the same level of pleasure in PE as females (or males) in mixed ability
160 groups? Did the students (males or females) with low (average or high) ability levels in
161 alternating groups feel the same level of pleasure in PE as students (males or females) with low
162 (average or high) levels of ability in mixed ability groups?

163 **Methods**

164 **Participants**

165 The participants included 178 secondary school students (97 females, 81 males) aged
166 11 to 15 years ($M = 13.17$, $SD = .81$), with 72 students in 9th grade enrolled in a basketball unit

167 (11 weeks) and 106 students in 8th grade enrolled in an endurance unit (6 weeks). Seventy-eight
168 students practiced PE in alternating groups (alternating ability-based and mixed ability groups),
169 and 100 students practiced in mixed ability classes.

170 **Measurement**

171 Pleasure was assessed at the end of the activity units using a French language validated
172 scale of 10 items rated on a 6-point Likert scale (from “not at all agree” (1) to “strongly agree
173 (6) (Delignières & Perez, 1998). This one-dimensional questionnaire was validated and adapted
174 from the English version of the "Physical Activity Enjoyment Scale" (PACES) (Kendzierski &
175 DeCarlo, 1991) (18 items) (Delignières & Perez, 1998). Delignières and Perez (1998) adapted
176 the PACES validated by Kendzierski and DeCarlo (1991). This scale focuses on the pleasure
177 experienced during physical exercise. Delignières and Perez's goals were to build a scale
178 adapted for adolescents and to evaluate, a posteriori, the degree of pleasure experienced in an
179 activity unit, notably, in PE (Table 1): a higher mean score indicates greater pleasure. In
180 Delignières and Perez's (1998) validation study, a confirmatory factor analysis (CFA) indicated
181 a good fit of the one-factor structure model (Goodness of Fit Index = .995, Adjusted Goodness
182 of Fit Index = .992, Incremental Fit Index = .999, Root Mean Square Residual = .0476, Ratio
183 $\chi^2/ddl = 1.095$). The Cronbach's alphas for this scale in the validation study (Delignières &
184 Perez, 1998) and in our study were high (.92 and .85, respectively) (Cronbach, 1951).

185 **Data collection and analysis**

186 Permission to conduct this study was obtained from the Ethics Committee of the State
187 of Vaud University of Teacher Education (HEP-VD, Switzerland) and from the school principal
188 and PE teachers. Students volunteered to participate in this study. The study was conducted in
189 a Swiss secondary school in which the PE teachers introduced ability-based grouping in one of
190 the three weekly periods (45 minutes). In this school, students of the same grade level (e.g., all
191 students in the 9th grade) have a double period of PE at the same time. For school organizational

192 issues, students were grouped based on ability in a double period every 2 weeks; during the
193 remaining two weekly PE double periods, the students participated in mixed ability PE classes.
194 PE teachers established three ability-based groups (low, average, and high) based on the results
195 of specific physical, technical, and/or tactical tests administered at the beginning of each
196 activity unit. In the endurance unit, the distance covered in a Cooper test (12 minutes) was used
197 to determine the students' initial ability levels in terms of endurance (Table 2). During this unit,
198 teachers prepared students for a cross-country race (4.2 km) held at the end of the school year,
199 and the result of the Cooper test allowed teachers to calculate a target time for each ability-
200 based group (Table 2). Teaching in the endurance unit emphasized teamwork among students
201 in the lowest ability-based group, and the instruction became more individualized for the
202 average and highest ability-based groups. The teaching objectives and contents were
203 differentiated for each ability-based group (Table 2). In the basketball unit, the PE teachers used
204 students' performance on a timed technical track to determine their ability levels. For each
205 effective action (i.e., dribbling the ball without walking, passing the ball against a box and
206 catching it before it bounced on the ground, jumping shooting, and goals), students were
207 awarded one point. Students could win a maximum of 16 points on the technical track (i.e., four
208 chained actions two times on both sides, departure on the right and on the left of the playing
209 field), and they were classified into ability-based groups based on total points awarded (Table
210 2). The total time on the technical track was used to re-categorize a student into a better ability-
211 based group if he/she obtained few points but had a good time. In this study, in addition to
212 examining the technical timed track, we estimated students' in-game efficiency to verify and
213 adapt the groups' competition. To estimate in-game efficiency, three researchers directly
214 observed and coded the students' psychomotor actions during a basketball game (5 students per
215 team, 7 minutes). The observation criteria were selected in collaboration with PE teachers, their
216 learning goals and existing collective sports observation checklists. For each identified action,

217 points were assigned: successful dribbling (i.e., dribbling the ball without walking) (+1 pt),
218 successful pass (i.e., a student on the passer's team caught the ball) (+ 1 pt), goal (+ 2 pts),
219 centered shot (without goal) (+ 1 pt), unsuccessful shot (0 pts), and lost ball (-2 pts). A
220 coefficient of efficiency in the game was calculated for each student: (points + ball
221 possessions) / 2. Of note, only two students were switched into different ability-based groups
222 following observation. In the basketball unit, teachers emphasized playing games with different
223 teaching objectives and contents based on the ability of each group (Table 3).

224 The questionnaire with the pleasure scale was completed at the end of each activity unit
225 (i.e., basketball and endurance). The students were reminded that their participation was
226 voluntary, their responses would remain confidential and they could withdraw their
227 participation at any time. The students completed the questionnaire in a classroom under the
228 supervision of the teacher and had the opportunity to ask questions if necessary. The entire
229 questionnaire was completed in approximately 15 minutes.

230 A list including students' assigned ID number, date of birth, and gender allowed us to
231 perform analyses incorporating both the data collected through observations at the beginning
232 of the activity units and the questionnaires conducted at the end of the activity units.

233 The analyses were performed using IBM SPSS Statistics Software (version 22.0).
234 Three-way analyses of variance (ANOVAs) (3X2X3) were used to examine the main and
235 interaction effects of grouping forms, student gender and ability level on the pleasure
236 experienced in the basketball and endurance units. The significance level was set at an alpha of
237 .05.

238 **Results**

239 A significant main effect of grouping forms was identified for the pleasure experienced
240 in the basketball unit, $p = .04$, and a small but non-significant effect was identified for the
241 pleasure experienced in the endurance unit, $p = .07$. The students in the alternating groups

242 (alternating ability-based and mixed ability groups) reported higher levels of pleasure than the
243 students in the mixed ability classes (Tables 4 and 5).

244 There was no significant main effect of student gender or ability level on the pleasure
245 experienced in either activity unit (Tables 4 and 5). The students in the three different ability-
246 based groups experienced a similar level of pleasure in the basketball unit, $p = .30$, and
247 endurance unit, $p = .76$. The female students' levels of pleasure in the basketball unit, $p = .94$,
248 and endurance unit, $p = .20$, were similar to those of the male students.

249 Finally, there was no significant interaction effect between the two or three independent
250 variables (i.e., grouping forms, student gender and ability levels) for the two activity units
251 (Tables 4 and 5).

252 Discussion

253 The purpose of this study was to estimate the effects of grouping forms, student gender
254 and ability level on the pleasure experienced in two PE activity units (i.e., endurance and
255 basketball). Our results demonstrated that grouping forms influenced the pleasure experienced
256 in PE, regardless of the students' gender or ability level. The alternation of ability-based and
257 mixed ability groups had a positive effect on the pleasure experienced in PE. The students in
258 the alternating groups (alternating ability-based and mixed ability groups) perceived, on
259 average, increased pleasure in PE compared with the students in the mixed ability classes. Of
260 note, a significant main effect of grouping forms was identified for the pleasure experienced in
261 the basketball unit and a nearly significant effect ($p = .07$) for the pleasure experienced in the
262 endurance unit. The alternation of learning contexts may be a good compromise to satisfy both
263 students' social needs and learning expectations. PE in mixed ability classes during two weekly
264 PE periods may satisfy the students' social needs. Social needs are very important for students
265 and determine student attitudes toward PE (Haynes et al., 2008). In a study by Haynes et al.
266 (2008), students reported that PE allowed interactions between boys and girls, which were

267 rarely allowed in other disciplines. Students also indicated the importance of spending time
268 with their friends in PE classes. However, the practice of PE in ability-based groups during two
269 periods every 2 weeks permitted the individualization and adaptation of learning content to the
270 students' learning needs (Haynes et al., 2008).

271 No main effect of student gender or ability level was identified for the pleasure
272 experienced by the students in the basketball and endurance units. The pleasure experienced in
273 PE units therefore appears to be independent of student characteristics (i.e., gender, ability
274 level) and is not associated with achievement in PE. As underlined by Haye (2011), pleasure in
275 PE may be influenced by different sources. Regarding the importance of pleasure in sports
276 engagement, the results of this study are quite interesting because the pleasure experienced in
277 PE was more influenced by a teaching variable (i.e., grouping forms) than by student
278 characteristics. Some studies have shown a positive relationship between pleasure in PE and
279 perceived competence and/or gender (Carney et al., 2012; Carroll & Loumidis, 2011;
280 Fairclough, 2006; Hassandra, Goudas, & Chroni, 2003; Luke & Sinclair, 1992; Pühse, et al.,
281 2005). Of note, these previous studies did not examine the interaction effects of student
282 characteristics and situational factors. Dudley et al. (2013) uncovered relatively little variation
283 between females and males at baseline. They also showed that situational factors, such as
284 having to change uniforms (for females) and peer relationships (for males), had the largest
285 negative effect on students' overall enjoyment of PE between Grades 7 and 8. In addition, the
286 results of this study can be related to Ed Diener's studies exploring people's subjective well-
287 being (Diener, 1996; Diener, Suh, Lucas, & Smith, 1999). As underlined by Diener et al. (1999),
288 "all the demographic factors taken together do not account for much variance in subjective
289 well-being. This is probably because the effects of demographic variables are probably
290 mediated by psychological processes" (p. 294). In this regard, a focus on the effect on perceived
291 competence or gender orientation (Bem, 1976) would be more interesting than a focus on

292 students' ability level or gender. Nevertheless, as Diener (1996) highlighted when discussing
293 subjective well-being, simply focusing on psychological processes is problematic, and it is
294 important to consider relevant situational factors. In addition to grouping forms, it would be
295 interesting to identify other teaching factors that could affect pleasure in PE (e.g., co-education
296 vs. no co-education, the use of new technologies).

297 No interaction effects between grouping forms, student gender and ability level were
298 identified for the pleasure students experienced in the basketball and endurance units. The
299 alternation of grouping forms, such as mixed classes, appears to be equitable, as females and
300 males as well as students with different ability levels experienced the same levels of pleasure.
301 Combining this result with the positive effect of alternating groups on pleasure, this study
302 reinforces the need to overcome the dilemma of homogeneity vs. heterogeneity (Crahay, 2000;
303 Dupriez & Draelants, 2004; Ireson & Hallam, 2001; Slavin, 1987).

304 **Limitations of this study and future research**

305 This study has some limitations. First, the present investigation focused on the pleasure
306 experienced in PE only. It would be interesting to study the effects of alternating groups on
307 actual learning in PE and other psychological factors associated with learning (e.g., sports self-
308 concept).

309 Second, the ability-based groups were established according to a timed technical track
310 and observations of the game in the basketball unit and according to the distance covered in the
311 Cooper test in the endurance unit. Three researchers coded the students' actions during the
312 basketball game; the researchers' coding decisions were compared directly after their
313 observations and adapted if some differences emerged. Nevertheless, neither inter- nor intra-
314 observer reliability was established for these observations. It would have been preferable to use
315 video recording to code the students' actions a posteriori. Furthermore, the criteria for
316 observations of the game were selected with PE teachers, but it would have been preferable to

317 use validated observation tools, such as the "Team Sport Assessment Procedure" (TSAP)
318 (Grehaigne, Godbout & Bouthier, 1997). For the endurance unit, the Cooper test was used
319 because it was the test included in the evaluation book developed for the State of Vaud in
320 Switzerland. Nevertheless, this test is likely not the best option (e.g., allowed walking, no
321 constraints of regularity and progressivity). For both activity units, in-depth reflections on the
322 tests and tools used to assess student ability levels are needed. In addition, further research
323 should focus on and compare the repartition of students (e.g., males and females) of each ability
324 level according to the test used for diagnostic evaluation (e.g., decontextualized, contextualized
325 test in team sports, other endurance tests).

326 Third, this study was conducted in a specific context: a secondary school in which PE
327 teachers introduced alternating groups years ago and commonly employed such grouping. Of
328 note, this school is located in the State of Vaud in Switzerland, where students are not graded
329 on PE; thus, PE grades do not influence students' pleasure experienced in PE (Allain, Deriaz,
330 Voisard, & Lentillon-Kaestner, 2015). The sample size in this study was relatively small ($N =$
331 178). Although data were collected from all students in Grades 8 and 9, the crossing of two
332 types of grouping (mixed ability classes vs. alternating groups) and three ability levels (high,
333 average, and low) for each activity led to comparisons of small groups. In addition, the
334 difference in the results obtained for the two activities is difficult to explain because there were
335 too many differences between the basketball and endurance units, including the type of
336 activities (basketball vs. endurance), the students' grade level (8th vs. 9th grade) and the duration
337 of the activity units (11 vs. six weeks). This study provides the first proof of the positive effects
338 of alternating groups; however, the results must be replicated in other schools, contexts, and
339 activity units to clearly identify the specific factors that influence the pleasure experienced in
340 PE (e.g., type of activities, duration of activity units, student education level, school context).

341 Fourth, the results of this study were based on a quantitative method that measured
342 pleasure at one time point (at the end of the activity unit), permitting cross-sectional analysis
343 only. Because the results are very promising, future research should include pre- and post-test
344 measures to allow longitudinal analysis. In addition, interviews with students would allow for
345 a better understanding of why the pleasure experienced in PE increased when the ability-based
346 and mixed groups were alternated.

347 **Implications for Practice**

348 Although the study has some limitations, it is innovative. Thus, it is important to
349 highlight the practical implications of the findings for physical education classes. Regarding
350 the educational value of pleasure in PE and the importance of pleasure for the development of
351 students' physical activity habits (Booth, 2009; Bui-Xuân et al., 2007; Hawkins, 2008; Pringle,
352 2010; Rintala, 2009; Wellard, 2012), this study encourages teachers to alternate grouping forms
353 in PE.

354 Nevertheless, this study highlights (but does not resolve) the problem of tests and
355 criteria that determine students' ability level in an activity: what type of test/criteria should PE
356 teachers use in diagnostic evaluation? In this study, we added a direct in-game observation
357 based on selected criteria that complemented the timed technical track in the basketball unit; in
358 fact, only two students were classified into another ability-based group following the
359 observation of the game. Regarding the difficulty that a PE teacher might experience in using
360 a criterion directly observed in the game, we recommend that teachers use a timed technical
361 track to estimate students' initial ability level and then complete the evaluation through a non-
362 criterion-oriented observation. A criterion-oriented observation could be performed by
363 students: each student could code the actions of another student. Nevertheless, the use of student
364 observations would require additional training, and it would be difficult to conduct such training
365 for diagnostic evaluation.

366 PE teachers must also be conscious that implementing ability-based groups (instead of
367 mixed ability classes) in PE requires a high level of collaboration among the PE teachers of the
368 school and increased coordination between the PE teachers and the school administration to
369 adapt the school schedules to ensure that all classes of the same grade level (or at least three
370 classes) are held in the same time slot for the double periods of PE.

371 In addition, it is necessary to adapt lessons to the students' learning needs for each
372 ability group and each activity unit. In the secondary school where the study was conducted,
373 the teaching content was adapted to the learning needs of students in the three ability groups,
374 and the ability-based groups were changed for each PE activity unit following an initial
375 assessment of ability level. The greater pleasure perceived by the alternating groups in this
376 study may be connected to the quality and adaptation of teaching content in this school. This
377 concept is underlined by Kulik and Kulik's (1982) meta-analysis and by several other authors
378 (Grossen, 1996; Hutchison, 2003; Lou et al., 1996; Slavin, 1987). Regardless of whether the
379 curriculum was adjusted to the ability level of students in the ability-based groups, the effects
380 of these groups were positive for all students.

381 **Conclusion**

382 Through their instructional choices (i.e., grouping forms), PE teachers play an important
383 role in the pleasure that students experience in PE. Therefore, PE teachers aid in the
384 development of young individuals' additional and quality physical activity (Castelli & Beighle,
385 2007; Tappe & Burgeson, 2004) and in reducing the problems of inactivity and overweight
386 found in our Western societies (Andreyeva & Sturm, 2006).

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656 Table 1

657

658 *The One-Dimensional Questionnaire Measuring the Pleasure Experienced in an Activity Unit*
659 *in PE, Validated by Delignières and Perez (1998)*

660

| | |
|----|--|
| 1 | Je n'ai pas aimé ce cycle |
| 2 | J'ai trouvé que ce cycle était agréable |
| 3 | Ce cycle n'était pas amusant |
| 4 | J'ai trouvé que c'était un cycle dynamique |
| 5 | Ce cycle était triste |
| 6 | J'ai trouvé que c'était un cycle très excitant |
| 7 | Ce cycle m'a apporté beaucoup de choses |
| 8 | Durant ce cycle, j'ai vraiment eu l'impression de réaliser quelque chose |
| 9 | Ce cycle m'a changé les idées |
| 10 | J'aurais préféré faire autre chose |

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663 Table 2

664

665 *Criteria Used in the Cooper Test to Determine Students' Initial Ability Level, Target Time for*
 666 *Cross-Country Race and Teaching Objectives for each Ability-Based Group in the Endurance*
 667 *Unit*

668

| | Distance covered in the Cooper test (12 min) | Target time for cross race (4.2 km) | Teaching objectives |
|-------------------|--|-------------------------------------|--|
| Group A (lower) | < 1800 m | < 36 min | Discovery and feeling of effort regularity |
| Group B (average) | $1800 \leq - \leq 2200$ m | < 30 min | Stabilization of run cadence |
| Group C (best) | > 2200 m | < 25 min | Improvement of chronometric performance |

669

670

671 Table 3

672

673 *Points Obtained on Technical Track, Students' Initial Ability Level and Teaching Objectives*
 674 *for each Ability-Based Group in the Basketball Unit*

675

| | Points obtained on technical track | Students' initial ability level | Teaching objectives |
|----------------------|--|---|---|
| Group A (lower) | 0-7 | The student does not control the ball enough to progress | The student advances the ball toward the basket |
| Group B (average) | 8-11 | The student advances the ball toward the basket | The student advances the ball toward the basket within a team |
| Group C (best) | 12-16 | The student advances the ball toward the basket within a team | The student advances the ball toward the basket within a team by seeking to create unopposed spaces to score |

676

677 Table 4

678

679 *Effects of Grouping Forms, Student Gender and Ability Level on the Pleasure Experienced in*
680 *the Endurance and Basketball Units: Three-way ANOVAs*

681

| | Source | Type III Sum of Squares | <i>df</i> | Mean square | <i>F</i> | <i>p</i> | η_p^2 |
|--|--|----------------------------|-----------|----------------|----------|----------|------------|
| Basketball | Corrected Model | 12.561a | 11 | 1.14 | 1.42 | 0.19 | 0.21 |
| | Intercept | 1124.10 | 1 | 1124.10 | 1397.18 | 0.00 | 0.96 |
| | Gender | 0.01 | 1 | 0.01 | 0.01 | 0.94 | 0.00 |
| | Grouping forms | 3.73 | 1 | 3.73 | 4.63 | 0.04 | 0.07 |
| | Ability level | 1.96 | 2 | 0.98 | 1.22 | 0.30 | 0.04 |
| | Gender * grouping forms | 0.52 | 1 | 0.52 | 0.65 | 0.42 | 0.01 |
| | Gender * ability level | 2.48 | 2 | 1.24 | 1.54 | 0.22 | 0.05 |
| | Grouping forms * ability level | 3.48 | 2 | 1.74 | 2.16 | 0.12 | 0.07 |
| | Gender * grouping forms * ability level | 0.84 | 2 | 0.42 | 0.52 | 0.60 | 0.02 |
| | Error | 48.27 | 60 | 0.81 | | | |
| | Total | 1542.93 | 72 | | | | |
| | Corrected total | 60.83 | 71 | | | | |
| | Endurance | Corrected Model | 14.427b | 11 | 1.31 | 1.22 | 0.28 |
| Intercept | | 1200.94 | 1 | 1200.94 | 1118.45 | 0.00 | 0.92 |
| Gender | | 1.81 | 1 | 1.81 | 1.69 | 0.20 | 0.02 |
| Grouping forms | | 3.56 | 1 | 3.56 | 3.31 | 0.07 | 0.03 |
| Ability level | | 0.60 | 2 | 0.30 | 0.28 | 0.76 | 0.01 |
| Gender * grouping forms | | 0.00 | 1 | 0.00 | 0.00 | 0.98 | 0.00 |
| Gender * ability level | | 0.79 | 2 | 0.39 | 0.37 | 0.69 | 0.01 |
| Grouping forms * ability level | | 4.25 | 2 | 2.12 | 1.98 | 0.14 | 0.04 |
| Gender * grouping forms * ability level | | 2.30 | 2 | 1.15 | 1.07 | 0.35 | 0.02 |
| Error | | 100.93 | 94 | 1.07 | | | |
| Total | | 1940.95 | 106 | | | | |
| Corrected total | | 115.36 | 105 | | | | |

682 a R-square = .206 (Adjusted R-square = .061)

683 b R-square = .125 (Adjusted R-square = .023)

684

685

686

687

688 Table 5

689 *Means and Standard Deviations for the Pleasure Experienced in the Basketball and Endurance*
 690 *Units and in the Three Ability-Based Groups*

| Gender | Group forms | Ability levels | Basketball | | | Endurance | | |
|---------|--------------------|----------------|------------|-----------|----------|-----------|-----------|----------|
| | | | <i>M</i> | <i>SD</i> | <i>n</i> | <i>M</i> | <i>SD</i> | <i>n</i> |
| Females | Mixed classes | High | 4.43 | 1.65 | 3 | 3.68 | 0.93 | 15 |
| | | Average | 4.10 | 1.13 | 10 | 3.88 | 1.03 | 12 |
| | | Low | 4.38 | 0.80 | 12 | 3.70 | 1.35 | 3 |
| | | Total | 4.27 | 1.01 | 25 | 3.76 | 0.98 | 30 |
| | Alternating groups | High | 5.95 | 0.07 | 2 | 3.95 | 1.29 | 5 |
| | | Average | 4.60 | 0.81 | 6 | 4.48 | 0.98 | 17 |
| | | Low | 4.58 | 0.98 | 4 | 4.16 | 1.18 | 8 |
| | | Total | 4.81 | 0.92 | 12 | 4.31 | 1.07 | 30 |
| | Total | High | 5.04 | 1.43 | 5 | 3.75 | 1.00 | 20 |
| | | Average | 4.29 | 1.02 | 16 | 4.23 | 1.03 | 29 |
| | | Low | 4.43 | 0.82 | 16 | 4.04 | 1.17 | 11 |
| | | Total | 4.45 | 1.00 | 37 | 4.03 | 1.05 | 60 |
| Males | Mixed classes | High | 4.21 | 0.97 | 11 | 4.67 | 0.63 | 10 |
| | | Average | 5.07 | 0.70 | 6 | 4.04 | 1.08 | 12 |
| | | Low | 4.18 | 0.61 | 4 | 3.50 | 1.27 | 2 |
| | | Total | 4.45 | 0.90 | 21 | 4.26 | 0.97 | 24 |
| | Alternating groups | High | 5.17 | 0.67 | 7 | 4.04 | 0.98 | 12 |
| | | Average | 4.64 | 0.77 | 5 | 4.58 | 1.50 | 6 |
| | | Low | 4.65 | 0.21 | 2 | 4.95 | 0.81 | 4 |
| | | Total | 4.91 | 0.68 | 14 | 4.35 | 1.13 | 22 |
| | Total | Good | 4.58 | 0.97 | 18 | 4.32 | 0.88 | 22 |
| | | Average | 4.87 | 0.73 | 11 | 4.22 | 1.22 | 18 |
| | | Low | 4.33 | 0.54 | 6 | 4.47 | 1.13 | 6 |
| | | Total | 4.63 | 0.84 | 35 | 4.30 | 1.03 | 46 |
| Total | Mixed classes | High | 4.26 | 1.07 | 14 | 4.07 | 0.95 | 25 |
| | | Average | 4.46 | 1.08 | 16 | 3.96 | 1.04 | 24 |
| | | Low | 4.33 | 0.75 | 16 | 3.62 | 1.15 | 5 |
| | | Total | 4.35 | 0.96 | 46 | 3.98 | 0.99 | 54 |
| | Alternating groups | High | 5.34 | 0.67 | 9 | 4.01 | 1.04 | 17 |
| | | Average | 4.62 | 0.75 | 11 | 4.51 | 1.10 | 23 |
| | | Low | 4.60 | 0.77 | 6 | 4.43 | 1.10 | 12 |
| | | Total | 4.86 | 0.79 | 26 | 4.33 | 1.08 | 52 |
| | Total | High | 4.68 | 1.07 | 23 | 4.05 | 0.97 | 42 |
| | | Average | 4.52 | 0.95 | 27 | 4.23 | 1.09 | 47 |
| | | Low | 4.40 | 0.74 | 22 | 4.19 | 1.14 | 17 |
| | | Total | 4.54 | 0.93 | 72 | 4.15 | 1.05 | 106 |

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