
Effect of sex, grade and school on enjoyment of physical education

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Abstract

The present study aimed to verify the unique effects of sex, grade and school, as well as interactive effects (sex vs grade), on enjoyment of Physical Education. The sample was composed of 301 students (140 males and 161 females). The Brazilian version of Physical Education Teaching Processes Questionnaire was applied in the classroom. The results generally indicated that sex, grade and school have a unique significant effect in the on enjoyment of Physical Education. Furthermore, interactive effects (sex vs grade) were noticed. Boys who attend less advanced grades tend to report higher levels of enjoyment in school Physical Education. A school Physical Education class that respects the interests and needs of students and which is concerned with motivating its students to succeed in Physical Education at school may encourage them to be physically active outside of school.

KEYWORDS: motivation, sex, school physical education.

Efeito do sexo, grade e escola no prazer com a educação física

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Resumo

O presente estudo teve como objetivo verificar os efeitos únicos do sexo, série e escola, bem como efeitos interativos (sexo versus série), no prazer da Educação Física. A amostra foi composta por 301 estudantes (140 homens e 161 mulheres). A versão brasileira do Questionário de Processos de Ensino em Educação Física foi aplicada em sala de aula. Os resultados geralmente indicam que sexo, série e escola têm um efeito significativo único no prazer na Educação Física. Além disso, foram observados efeitos interativos (sexo versus série). Meninos que frequentam séries menos avançadas tendem a reportar níveis mais altos de prazer na Educação Física escolar. Uma aula de Educação Física escolar que respeite os interesses e necessidades dos alunos e que esteja motivada a motivar seus alunos a terem sucesso na Educação Física na escola pode incentivá-los a serem fisicamente ativos fora da escola.

Palavras-chave: motivação, sexo, educação física escolar.

Efecto del sexo, el grado y la escuela en el disfrute de la educación física

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Resumen

El presente estudio tuvo como objetivo verificar los efectos únicos del sexo, el grado y la escuela, así como los efectos interactivos (sexo vs grado), en el disfrute de la educación física. La muestra estuvo compuesta por 301 estudiantes (140 hombres y 161 mujeres). La versión brasileña del Cuestionario de Procesos de Enseñanza de Educación Física se aplicó en el aula. Los resultados generalmente indicaron que el sexo, el grado y la escuela tienen un efecto significativo único en el disfrute de la educación física. Además, se notaron efectos interactivos (sexo versus grado). Los niños que asisten a grados menos avanzados tienden a reportar mayores niveles de disfrute en la educación física escolar. Una clase de educación física de la escuela que respeta los intereses y las necesidades de los estudiantes y que se preocupa por motivar a sus estudiantes a tener éxito en la educación física en la escuela puede alentarlos a estar físicamente activos fuera de la escuela.

Palabras-clave: motivación, sexo, Educación física escolar.

Introduction

According to WHO international recommendation (2010), children and adolescents must perform 60 min or more of moderate to vigorous physical activity daily. In the same year, Guthold, Cowan, Autenrieth, Kann and Riley (2010) drew attention to the evidence that this recommendation was not being followed. Despite the efficient and consolidated scientific dissemination of this type of recommendation, adolescents and their guardians are not aware of the risk of being physically inactive in early age. According to CAHMI (2016), less than a quarter (24%) of children aged 6 to 17 years participate in 60 minutes of physical activity every day. More recently, Guthold, Stevens, Riley and Bull (2020) stated that the levels of physical activity among teenagers remain low and compromise their current and future health, which is in consonance with the available evidence.

There is a reduction in the physical activity levels throughout life, especially during the transition from late childhood and adolescence to adult life (Westerterp, 2018), however, it seems that the physical inactivity issue is also extremely worrisome even among teenagers themselves. According to Guthold, Stevens, Riley and Bull (2020), based on a large global sample, the prevalence of physical inactivity is around 81% among young people and adolescents. Specifically, in Brazil, the results showed a prevalence of 86.6%.

It seems that the lack of physical activities presented in adult life might be associated with past experiences in physical activities during childhood and teenage years (Duncan, Lisa, Nigel, & Chaumeton, 2015). According to Shephard e Trudeau (2000), there are empiric evidences of the relation between enjoyment in practicing school physical education (*PE enjoyment*) and the maintenance of the practice of physical activities in adult life. Yli-Piipari, Layne, Hinson and Irwin (2018), state that low motivational experiences in school PE are transferred to motivation for practicing physical activities outside the school. Thus, the school plays a pivotal role in the development of an active lifestyle throughout life. According to Yli-Piipari, Barkoukis, Jaakkola and Liukkonen (2013) the motivational orientation related to the task and enjoyment in school physical education are factors that inhibit the decline of physical activity observed in teenagers.

In the last decades, studies that seek to understand the factors that interfere in enjoyment of PE classes have been published. Sex has been pointed out as a factor that interferes in enjoyment of PE classes, which, as a consequence, affects the practice of physical education among the students. According to the Centers for Disease Control and Prevention (2018), there are instructional strategies that may increase the students' enjoyment with PE classes, which may consequently increase their levels of physical activity. For instance, activities must be conducted in different ways for boys and girls.

In addition to the evidence that gender may have influence on the enjoyment of PE classes, there is also evidence that suggests an age-related decline in enjoyment of PE among students (Parish, & Treasure, 2003; Fairclough, & Stratton, 2005). In a longitudinal study, Prochaska, Sallis, Slymen, and McKenzie (2003) found a consistent decline in PE enjoyment from 4th to 6th grades. Additionally, Cairney, Kwan, Veldhuizen, et al. (2012)

found that Physical Education enjoyment predicted physical activity throughout all grades for boys.

Finally, there has been some evidence that some characteristics of school physical environments may influence the way students perceive PA (Nichol, Pickett, & Janssen, 2009; Sallis, Cervero, Ascher, Henderson, Kraft, & Kerr, 2006). Nichol et al. (2009) found that 6th to 10th grade students that went to schools with more PA suitable infrastructure reported higher rates of both class time and free-time PA.

Considering that although international studies have found evidences that gender, grades and school can have an impact on PE enjoyment, there are no studies in Brazil that investigate those variables, the present study sought to fill this gap, and verified the unique effects of sex, grade and school in the dimensions of *PETPQ*. In addition, it was investigated whether there would be interactive or combined effects of sex and grade on the dependent variable. Such investigation was based on the hypothesis that sex, grade and school would exert unique effects on enjoyment dimensions in school PE and that, in addition, there would be an interactive effect between sex and grade which would indicate that boys from less advanced grades would report higher levels of enjoyment in school Physical Education.

Method

Study design

The present study is cross-sectional, descriptive, relational and ex post facto.

Participants

The selection of participants was made under intentional and non-probabilistic sample techniques, and it was composed by 301 students (140 males and 161 females) from public schools in Bahia, aged between 12 and 18 ($M = 16.35$ $SD = 1.73$). Regarding the students' grades, the followed distribution was made: 7th grade (11.5%), 8th grade (15%) and 9th grade (12%) in elementary school, and 1st grade (27%), 2nd grade (14.5%) and 3rd grade (20%) in high school.

Instrument to assess enjoyment

The Brazilian version (Fernandes, Nunes, Silva, & Fernandes, 2015) of the *Physical Education Teaching Processes Questionnaire - PETPQ* (Hashim, Grove, and Whipp, 2008) was applied, which consists in 20 items distributed in six subscales that verify processes related to the students' enjoyment in school Physical Education: Competency compared to peers (items 3, 6, 8 and 13), Teacher-generated motivation (items 9, 16 and 19), Peer interaction (items 15 and 17), Parental involvement (items 1 and 20), Self-referenced competency (items 4, 5, 7 and 14) and Activity-generated motivation (2, 10, 11, 12 and 18). The statements were answered according to a five-point *Likert* scale (1= Disagree Completely; 2 = Disagree; 3 = Neither Disagree Nor Agree; 4 = Agree; and 5 = Agree Completely). The

scores of each factor are summed and divided by the number of items of the respective factor (subscale).

Procedure

For data collection, the principals of the schools were previously contacted in order to obtain the proper authorization, as well as schedule information and indication of the rooms in which the collection could be made. After this authorization, students over 18 and parents of students under 18 signed the Free, Prior and Informed Consent (FPIC). The Brazilian version of *Physical Education Teaching Processes Questionnaire* was applied, in a collective manner, with the permission of a teacher indicated by the school board. The duration of the application was from 10 to 20 minutes.

The present study was approved by the Santa Cruz State University (UESC) Research Ethics Committee (Protocol 250.483), accordingly to the CNS/MS n. 466/2012 Resolution.

Data analysis

Data analysis was divided into four stages. Firstly, we analyzed the normality premises, linearity, multicollinearity and homogeneity of the variance-covariance matrix using frequency, *scatter plots* and *Box's M test*. Then, we examined the reliability of the dimensions of the Brazilian version of *PETPQ* by calculating *Cronbach's alpha*. Finally, in the third stage, the procedures of multivariate analysis of variance (*MANOVA*) were applied to examine the unique effect of sex, grade and school, as well as the interactive effect between sex and grade in the *PETPQ* dimensions, with cut-off points of .20, .40, .80 representing small, medium and large effects, respectively (Cohen 1988). This analysis was performed in SPSS 22.0, and the level of significance was maintained in 5% ($p < .05$).

Results

Preliminary data analysis

Data on *PETPQ* dimensions scores were examined considering possible typing errors, omitted cases and the premises for multivariate analysis. Omitted cases were not registered, the errors in data entry were corrected and there were no extreme cases in multivariate and univariate analysis.

The premises of normality, linearity and multicollinearity were not violated, neither was the variance-covariance matrix homogeneity, accordingly to Tabachnick and Fidell (2001) recommendations. The internal consistency of *PETPQ* response dimensions was calculated using the *Cronbach's alpha* and the indices revealed were above the $\alpha > .70$ (Hair et al., 2014) criterion.

Analysis of the effect of sex

The results of the descriptive analysis and *MANOVA* by sex (male vs female) are presented in Table 1. In the multivariate analysis, it was verified

that this variable had a significant effect [$F(6.294) = 8.790, p < .05$; Wilks' Lambda = .848, $\eta_p^2 = .152$] on the *PETPQ* dimensions.

The subsequent univariate analysis verified that sex had a significant effect on Activity-generated excitement [$F(1.299) = 9.917; p < .05$; $\eta_p^2 = .032$], Other-referenced competency [$F(1.299) = 46.576; p < 0.01$; $\eta_p^2 = .135$] and Self-referenced competency [$F(1.299) = 15.727; p < .01$; $\eta_p^2 = .050$].

Table 1. Comparative analysis of the factors of the Brazilian version on *PETPQ* as a function of sex (female vs male)

	Female <i>M</i> ± <i>SD</i>	Male <i>M</i> ± <i>SD</i>	<i>F</i>	η_p^2
Parental encouragement	3.20 ± 1.02	3.32 ± 1.01	1.028	.003
Activity-generated excitement	3.52 ± .86	3.81 ± .74	9.917*	.032
Other-referenced competency	2.59 ± .71	3.18 ± .80	46.576*	.135
Self-referenced competency	3.38 ± .74	3.73 ± .79	15.727*	.050
Teacher-generated excitement	3.59 ± .93	3.58 ± .85	.004	.000
Peer interaction	3.76 ± .88	3.80 ± 1.01	1.132	.000

* $p < .05$

Analysis of the effect of grade

The results of the descriptive analysis and *MANOVA* by grades (1st, 2nd, 3rd, 7th, 8th, and 9th) are presented on Table 2. In the multivariate analysis, it was verified that this variable had a significant effect [$F(6.294) = 2.068; p < .05$; Wilks' Lambda = .812; $\eta_p^2 = .041$] on the *PETPQ* dimensions.

The subsequent univariate analysis verified that grades had a significant effect on Activity-generated excitement [$F(5.295) = 2.850; p < .05$; $\eta_p^2 = .046$] and Teacher-generated excitement [$F(5.295) = 3.680; p < .05$; $\eta_p^2 = .059$].

Table 2. Comparative analysis of the factors of the Brazilian version of PETPQ as a function of grades (1st, 2nd, 3rd, 7th, 8th and 9th)

	Elementary School			High School			<i>F</i>	η_p^2
	7 th grade	8 th grade	9 th grade	1 st grade	2 nd grade	3 rd grade		
	<i>M</i> ± <i>SD</i>	<i>M</i> ± <i>SD</i>	<i>M</i> ± <i>SD</i>	<i>M</i> ± <i>SD</i>	<i>M</i> ± <i>SD</i>	<i>M</i> ± <i>SD</i>		
Parental encouragement	3.11 ± 1.14	3.22 ± .88	3.11 ± .99	3.24 ± 1.15	3.65 ± .94	3.36 ± .80	2.041	.033
Activity-generated excitement	3.58 ± .75	3.76 ± .71	3.47 ± .94 ^a	3.84 ± .84	3.49 ± .85	3.98 ± .68 ^b	2.850*	.046
Other-referent competency	2.80 ± .72	2.89 ± .84	2.88 ± 1.02	3.07 ± .70	2.84 ± .80	2.77 ± .62	.680	.011
Self-referent competency	3.52 ± .79	3.61 ± .71	3.38 ± .92	3.62 ± .80	3.63 ± .65	3.56 ± .74	.779	.013
Teacher-generated excitement	3.66 ± .88 ^b	3.73 ± .80 ^b	3.38 ± .89 ^a	3.37 ± .95	3.39 ± .94	4.01 ± .70 ^b	3.680*	.059
Peer interaction	3.68 ± .99	3.77 ± .92	3.73 ± .89	3.72 ± 1.00	3.88 ± .90	4.02 ± .90	.848	.014

* $p < .05$; Note. Superscripts denote significant differences between groups; groups with the same superscript are not significantly different from each other.

Analysis of sex vs grade interactive effects

It was verified a significant effect in the combined interaction between sex and grade, in the Activity-generated excitement [$F(5.289) = 3.771$; $p < .05$; $\eta_p^2 = .061$] and Self-referenced competency [$F(5.289) = 4.510$; $p < .05$; $\eta_p^2 = .072$] dimensions.

Analysis of the effect of school

The results of the descriptive analysis and MANOVA by school (1 and 2) are presented on Table 3. In the multivariate analysis, it was verified that this variable had a significant effect [$F(6.294) = 4.233$, $p < .01$; Wilks' Lambda = .920, $\eta_p^2 = .080$] on PETPQ dimensions.

The subsequent univariate analysis verified that school had a significant effect on Parental encouragement [$F(1.299) = 16.870$, $p < .01$; $\eta_p^2 = .053$], Activity-generated excitement [$F(1.299) = 17.899$, $p < .01$; $\eta_p^2 = .057$], Other-referent competency [$F(1.299) = 6.611$, $p < .05$; $\eta_p^2 = .022$], Self-referent competency [$F(1.299) = 9.325$, $p < .05$; $\eta_p^2 = .030$] and Teacher-generated excitement [$F(1.299) = 9.376$, $p < .05$; $\eta_p^2 = .030$].

Table 3. Comparative analysis of the factors of the Brazilian version of PETPQ as a function of school (1 vs 2)

	School 1 <i>M</i> ± <i>SD</i>	School 2 <i>M</i> ± <i>SD</i>	<i>F</i>	η_p^2
Parental encouragement	3.41 ± .96	2.89 ± 1.06	16.870**	.053
Activity-generated excitement	3.78 ± .76	3.35 ± .87	17.980**	.057
Other-referenced competency	2.94 ± .75	2.68 ± .89	6.611*	.022
Self-referenced competency	3.63 ± .73	3.33 ± .86	9.325**	.030
Teacher-generated excitement	3.68 ± .85	3.34 ± .94	9.376**	.030
Peer interaction	3.85 ± .91	3.62 ± .97	3.798	.013

** $p < .01$ * $p < .05$

Discussion

In the present study, the hypothesis that sex, grade, and school would have significant effects on enjoyment with the Physical Education of Basic Education students was tested. In general, the hypothesis was successfully confirmed, and it indicated that those three variables influence how the students perceive different aspects related to their enjoyment in Physical Education classes in a unique way.

Regarding the sex variable, it was verified in the multivariate analysis that it had a unique and significant effect in the Other-referenced competency, Activity-generated excitement and Self-referenced competency dimensions, and its size was small. (Cohen, 1988). It is worth pointing out that sex (by $\eta_p^2 = .135$) is responsible for 13.5% of the total variance of the Other-referenced competency dimension, which indicates that boys tend to evaluate themselves more favorably than girls in terms of competency, when compared to their peers. Examples of items that compose this dimension are: "When doing PE activities, I am one of the best in my PE class" and "Other students think I am good at PE". The Activity-generated excitement dimension includes items such as "I am enthusiastic about PE activities" or "I like the action and excitement of PE activities". Once again, boys feel more excited and enthusiastic than girls with PE classes, even though the size of the effect of this variable on this dimension of enjoyment in PE class has been small ($\eta_p^2 = .032$). Finally, boys have also evaluated themselves more positively than girls on their Self-referenced competency (e.g.: "My sports skills have improved because of doing PE" or "The more I do PE activities, the better I get") although the size of its effect has also been small ($\eta_p^2 = .050$). This means that, in general, boys feel like they have improved their skills from doing PE more than girls.

These results are similar to the findings of Johnson, Erwin, Kipp, & Beighle (2017), which also concluded that boys and girls have different perceptions of the enjoyment in school PE. In the present study, the perceived differences were related to perception of competency in the practice of physical activity (Other-referenced competency and Self-referenced competency) and regarding Activity-generated excitement. Other studies (Cole, 1991; Villwock, & Valentini, 2007; Zunino et al., 2012) in the child development field have also indicated that the perception of athletic competency is more positive for boys. The differences in perception of enjoyment between boys and girls might also be related to the kind of PE activity that is taken into consideration. To Fairclough (2003), boys and girls have different preferences when it comes to school PE activities; while boys prefer team activities, girls prefer individual activities. Moreover, the author found negative correlations between enjoyment of Physical Education and moderate-to-vigorous physical activity among girls. In the same way, Westerstahl, Barnekow-Bergkvist, and Jansson (2005) reported that girls prefer low intensity activities, differing from boys. It is possible to assume that higher intensity group activities tend to generate more excitement, which could explain the higher scores noticed in boys in this dimension of enjoyment with school PE.

Regarding the grade variable, it was verified that it had a significant unique effect in the Activity-generated excitement and Teacher-generated excitement dimensions, which showed small and medium sizes (Cohen, 1988), respectively. These latent variables are measures that assess whether the student is enthusiastic or excited about PE Activities (e.g.: "I like the action and the excitement of PE Activities") and whether the teacher is a promoter of motivation in school physical education (e.g.: "My PE teacher makes PE an interesting experience for me"). In Teacher-generated excitement, the grade variable was responsible for explaining about 6% of its total variance and in Activity-generated excitement, that percentage was around 5%. The post hoc test (*Bonferroni*) indicated that in the Activity-

generated excitement dimension, the differences are between ninth grade of elementary school and third grade of high school, therefore, between pre teens and teens. In the Teacher-generated excitement dimension, the difference also appeared between these same grades, however, besides that, differences were noticed in grades that are generally too close in terms of the students' ages (seventh and ninth grade, and eighth and ninth grade in elementary school). When observing the average of the groups (grades), it was possible to notice that in the Activity-generated excitement and Teacher-generated excitement dimensions the scores were higher in the less advanced grades (9th grade in elementary school), where there are younger students, rather than in the 3rd grade of high school.

These results are consonant with the findings in international literature. Johnson et al. (2017) concluded that the 8th grade students (oldest group) had the lowest perception of a mastery climate (it emphasizes cooperative learning and several group ability that allows positive peer relationships, enhancing peer acceptance, and promoting close friendship), but the second highest perception of a performance climate (it emphasizes high ability, competition, winning and positive social comparison). Weiss, Corbin, & Pangrazi, (2000) suggest that students in a performance climate have been associated with showing lack of enjoyment and high anxiety. On the other hand, perceiving a mastery climate has been associated with higher enjoyment, higher perceived competency, beliefs that effort leads to success (Ntoumanis & Biddle, 1999) and also with students' intrinsic motivation in PE (Duda, 1996). Therefore, the studies of Johnson et al. (2017) indicate that it is in more advanced grades, where there are older students, that the perceptions of motivational environments most associated to lower enjoyment in PE classes are concentrated. In the same way, several studies have reported that there is an age-related decline in enjoyment of PE among students (Parish, & Treasure, 2003; Fairclough, & Stratton, 2005). Finally, Booth et al., (1997), Marsh, Papaioannou, Martin, & Theodorakis (2006), Barkoukis, Ntoumanis & Thøgersen-Ntoumani (2010) and Prochaska et al. (2003) reported that there was a decrease in enjoyment with PE with the increase of age and grades when using longitudinal methods, which allow to identify changes in perception of enjoyment with PE more stoutly along the time. In addition, the interactive hypothesis (sex vs grade), which predicted that the level of enjoyment in the school Physical Education would be higher among boys who attended the less advanced grades was also confirmed. In this study, boys in less advanced grades were those who reported higher levels of Activity-generated excitement and Self-referenced competency. This result confirms the findings of Parish and Treasure (2003), which noted an important decline of PA in PE from 6th to 8th grade, particularly for girls, but not for boys.

Regarding the school variable, in general, it had a significant effect on most of the *PETPQ* dimensions (except for the Peer interaction dimension), which indicated that school plays an important role in the enjoyment with school PE. These results are similar to the findings of Johnson et al. (2017), which reported significant differences among three schools in the matters of enjoyment with school Physical Education. The size of the effect of school on the dimensions ranged from small to medium. The dimensions that suffered the highest effects of school were Activity-generated excitement, followed by Parental encouragement, in which 5% to

6% of the variance was explained by the school variable. These dimensions include items such as "I am enthusiastic about PE activities" and "My parents encourage my involvement in PE" or "My parents are interested in the PE activities I do at school". Although they were small, the effects of the school on the other dimensions were also noticed: 2,2% of the variance in Other-referenced competency, 3% of the variance in Self-referenced competency and 3% of the variance in Teacher-generated excitement could be explained by the influence of the school the students attended.

It is important to point out that School 1 served both Elementary and Middle School students, while the School 2 only served High School. If we observe the averages for all dimensions of the enjoyment scale in School Physical Education, we will notice that School 1, which includes younger students, obtained higher scores. In that case, the results confirm the findings in various studies (Parish, & Treasure, 2003); Fairclough, & Stratton, 2005; Booth et al., 1997; Marsh et al., 2006; Barkoukis et al., 2010; Prochaska et al., 2003) which found a decrease in enjoyment in PE classes with the increase of age, with the use of cross-sectional and longitudinal methods.

According to Cairney et al (2012), in order to improve children engagement in PE and enhance the perception of competence, one should consider to expose children to a wider spectrum of activities, so that it would create more opportunities for them to experiment activities for which they may have a particular aptitude or yet they may find appealing, interesting, and challenging. Hashim et al. (2008), suggest some ideas to make school PE meet the students' individual interests, namely: i) considering the needs and interests of the male and female students; ii) offering challenging activities for all students iii) providing a wide possibility of choice of activities for the students. Thus, it seems important that the female gender is given an active voice in the planning of Physical Education classes, and that the proposed activities are diversified and attend to their specific interest, as a motivational strategy for the girls.

The present study has had the following limitations: i) the sample was of the intentional and non-probabilistic type and such sample types may not be representative of the population of school physical education students; ii) this is the first study published in the Brazilian context with the Brazilian version of *PETPQ*, therefore its results are still initial and it is of fundamental importance that future studies continue the process of investigation and confirmation of the results obtained; iii) the sample consisted of only elementary and high school students; and ii) the study was of the cross-sectional type, which does not allow causal inferences.

Conclusion

Sex, grade and school had a significant effect on the *PETPQ* dimensions. The results indicate that these nominal variables influence how students perceive school Physical Education and this should have a significant impact on the planning of such classes by teachers. In addition, sex and grade had an interactive effect on enjoyment in school Physical Education, which indicated that younger boys who attend less advanced

grades are those who report more enjoyment with school Physical Education, mainly due to the pleasure and enthusiasm that they feel during PE practice and because of the perception that these classes improve their performance and their sports skills. A school Physical Education class that respects the interests and needs of students, which takes into account the student's level of maturity and which is concerned with motivating its students to succeed in Physical Education at school may encourage them to be physically active outside of school.

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