

## Emotional experience of boys and girls and their perception of teacher's interpersonal behaviors: a sociocognitive perspective in physical education context

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### Abstract:

*Background:* Physical activity decreases during the transition from childhood to adolescence, with greater declines observed in girls. Positive emotional experiences in PE are considered beneficial for long-term engagement in physical activity. Research has repeatedly shown that girls do not perceive PE in the same way as boys. These differences impact their success. However, we know little about the psychological springs that explain them. *Purpose:* Based on a socio-cognitive theory of emotion, we compared the emotional experiences of boys and girls in PE, in order to examine their self-perceived positive and negative emotions experienced in class. Second, we analyzed the relationships between these perceived emotions and their perception of the teacher's interpersonal behaviors. *Method:* 419 students, including 231 girls, completed a questionnaire collecting their emotions usually experienced during PE classes and their perceptions of PE teacher's interpersonal behaviors. *Results:* Even though the students' emotional experience in PE is overall positive, positive emotions are experienced primarily by male students. They are associated with positive interpersonal behaviors and female teachers. On the contrary, girls express a less positive appreciation of PE, experience positive emotions less frequently and perceive less favorably the teachers' interpersonal behaviors. Pleasure emerged as a central aspect to consider when analyzing the emotional experience of boys and girls in PE. *Conclusions:* the results depict a worrisome picture of girls' emotional experience in PE, which may negatively impact their learning and their long-term involvement in sport activities. To make PE most suitable for girls, teachers can modulate their interpersonal behaviors in the classroom, especially by promoting structure (dominance) and cooperation with students.

**Keywords: Emotion, Experience, Sex, Teacher's Interpersonal Behaviors, Physical Education**

### Introduction

According to a report entitled "Physical Activity & Physical Inactivity of Children & Adolescents - New Situation in France", published in 2018, a decrease of more than 25% of French children's physical capacities has been observed in less than half a century. Only one third of adolescents (61% of boys and only 25% of girls) comply with physical activity recommendations. More specifically, Owen, Curry, Kerner, Newson and Fairclough (2017) showed that physical activity decreased during the transition from childhood to adolescence, with greater declines observed in girls. Generating positive emotions in young people in relation to sports activities has become a public health issue, especially for girls. Physical education (PE) can serve this purpose as it is the only place where students participate in sports and other physical activities on a mandatory basis. Positive emotional experiences in PE are considered beneficial for long-term engagement in physical activity (Leisterer & Jekauc, 2019). In the study of Sawicki and Gorner (2018), the studied adolescents were mainly accompanied by positive emotional states in PE. However, gender significantly differentiate the intensity of both the positive and negative emotions experienced.

In France, some indicators show that girls and boys do not experience PE in the same way. For example, a gap in results between students in PE (always at the expense of girls) has been noticed since the reform of the Baccalaureate in 1983. An average difference of 1.25 point between boys and girls is recurrent and confirmed by various studies (Vigneron, 2006). Like sport, PE values qualities traditionally associated to masculinity (combativeness, effort, energy, etc.). The differences do not really come under biological sex but rather refer to social sex (or gender). Researchers in the *doing gender* trend consider gender as a trait resulting from social situations. It occurs through daily interactions between individuals and refers to the repeated actions of the individual: "*Gender is not something we are, but something we do*" (West & Zimmerman, 1987, p. 126).

How can teachers take sex into account without reinforcing stereotypes, in order to promote positive boys' and girls' emotional experience in PE? Goetz, Bieleke, Gogol, Tartwijk, Mainhard, Lipnevich and Pekrun (2021) established reciprocal associations between teacher-student relationship and emotion in the classroom, in

all school domains. According to Nicaise, Bois, Fairclough, Amorose and Cogérino (2007), once the sex of the students was taken into consideration, the perceived feedback significantly predicted boys' as well as girls' enjoyment, perception of competence, effort and performance in PE. Thus, researchers proposed to become more aware of teacher's interpersonal behaviors in the classroom. When faced with students, the teacher develops an expectation, and regulate the interaction in a different way depending on whether it is a boy or a girl. Indeed, in the study by Bonniot-Paquien, Cogérino and Champely (2009), as much as 78% of teachers' interventions were aimed at boys. The teachers almost systematically expressed what was positive in the boys' work, which was not observed in what was said about the girls' work. Like students, teachers have different opinions regarding gender stereotypes (Ros-Gamon, Alguacil, Escamilla-Fajardo & Pérez-Campos, 2021).

These differences are maybe perceived by students and may influence their emotions in PE. In sport, Hively and El-Alayli (2014) showed women performed less well than men when they were taught that sex affected task performance. However, women and men performed equally well when women were taught there were no impact of sex on performance. The authors concluded that one minor comment regarding a very specific athletic task may sometimes impair task performance of women. In PE, a quantitative study based on self-determination theory demonstrated that female students who perceived more positively their teacher reported positive motivational orientations (Gairns, Whipp & Jackson, 2015). Teachers' interpersonal behaviors can therefore influence students' emotions. It remains to be seen what behaviors the teacher adopts with boys and girls, and which behaviors girls and boys are sensitive to.

### **Theoretical Framework**

#### *A socio-cognitive theory of emotion*

Since Darwin's work *The Expression of Emotions in Man and Animals* (1872), several researchers have developed a theory on emotion, with an emphasis on its physiological or cognitive components. In a cognitive assessment theories, it is considered that the brain is not only the place of simple reflexes, but that it acts in the decoding of emotional stimuli. The individual would store previous emotional experiences in memory, and when reliving them, an action would be generated. In his cognitive-motivational-relational theory (CMRT) of emotion, Lazarus (1991) followed this line reasoning by giving importance to cognitive processes linked to emotions. But his approach has the particularity of emphasizing interaction between emotions and the environment: "*We cannot understand the emotional life solely from the standpoint of the person or the environment as separate units*" (Lazarus, 1991, p. 89).

The interaction between a person and his environment would induce negative emotions when it prevents the satisfaction of needs, or positive emotions when it generates this satisfaction. Depending on the emotion felt, people act to maintain or restore optimal well-being conditions. While debates persist on the order of emergence of emotional components, researchers today agree to define emotions as salient, one-time moments composed of several interrelated elements: (a) expressive behavior; (b) cognitive evaluations; (c) physiological reactions; (d) patterns of action; (e) emotional experience. According to Tcherkassof and Frijda (2014), "*one of the major components of emotion is the subjective experience. This conscious experience of emotion reflects the underlying unconscious modalities (rating, interests, precedence ...), although it does so only in part and usually unbeknownst to the person*" (p. 519).

#### *A socio-cognitive theory of emotion in physical education*

Cognitive theories of emotion have given rise to much research in psychology of education. For example, Frenzel (2014) focused on teachers' emotions. According to his model, teachers follow different goals, observe students' engagement related to their goals, and then appraise this engagement, which contributes to their respective emotions. This approach therefore emphasizes the links between emotions and social context in which they emerge. On the contrary, the way the teacher behaves in the classroom can also generate positive and negative students' emotions.

The common point of these researches is the analysis of the influence of social context in emotional experience. To explore this aspect further in PE would be important. Indeed, in PE, not only negative emotions can decrease learning, but it can also harm the relationship between students and sports activities. Therefore, the objective of our research was to analyze boys' and girls' emotional experience in the French PE school context, in relation to their perception of PE teacher's interpersonal behaviors. More specifically, it involved: (a) comparing the emotional experiences of boys and girls in PE, in order to examine their self-perceived positive and negative emotions experienced in class; (b) analyzing the relationships between these perceived emotions and their perception of the teacher's interpersonal behaviors.

### **Materials and methods**

#### *Participants*

According to Table 1, eight PE teachers agreed to participate in this study. Of these four (two men and two women) taught grades 6 to 8 ("Collège" in France) while the other four taught grades 9 to 12 ("Lycée" in France). Of the 419 respondents, 231 (55.13%) were attending "Lycée" while the remainder were attending "Collège" (n = 188; 44.86%). More than half of the students were females (n = 231; 55.13%).

**Table 1. Descriptive Statistics of the Sample Composition**

SEX	TEACHERS		STUDENTS	
	Male	Female	Male	Female
<i>F</i>	4	4	188	231
<i>F (%)</i>	(50.0%)	(50.0%)	(44.87%)	(55.13%)
<b>SCHOOL LEVEL</b>				
<b>“COLLÈGE”</b>				
<i>F</i>	2	2	83	105
<i>F (%)</i>	(50.0%)	(50.0%)	(44.15%)	(55.85%)
<b>“LYCÉE”</b>				
<i>F</i>	2	2	118	113
<i>F (%)</i>	(50.0%)	(50.0%)	(51.08%)	(48.92%)
<b>MEAN AGE (YEARS)</b>	40.5 ± 9.94		14.28 ± 1.49	
<b>MEAN EXPERIENCE (YEARS)</b>	14.5 ± 9.68		---	

In order to estimate our sample size, we have identified and consulted related works such as Nicaise et al. (2007). Using the reported subsample sizes, mean values and standard deviations for two variables of interest (effort and pleasure), we have computed effect sizes for both variables using Lenhard and Lenhard’s (2016) online application. The values obtained for Cohen’s *d* were .334 and .270 respectively for a total of 241 participants (178 male teachers and 63 female teachers), which is considered below the zone of desired effects ( $\geq .400$ ) defined by Hattie (2012).

From this starting point, we relied on Howell’s (2008) formula ( $\delta = d$ ) to estimate a sample size sufficiently large for a power of 80%. We found that such a sample would be of 281 participants, well balanced between boys and girls. We chose to add 10% ( $281 \times .10 = n = 28$ ) more participants to anticipate for missing or unusable data and we also decided to add another 49 participants ( $308 \times .16 = 49$  participants) to compensate for the statistical power deficit that we had anticipated from using nonparametric statistical techniques for comparisons between independent groups (Conroy, 2018). The target sample size threshold was finally set at 358 participants. Since it was possible to increase the number participants without additional cost, we chose to select 61 more responding student which allowed to improve the quality of the data collected.

*Data collection*

Each student completed a three-part questionnaire. The first part was designed to collect socio-demographic data such as students’ sex, age, and grade level. The section about emotions consisted of collecting students’ perception of their emotions usually experienced during PE classes since the beginning of the school year. This self-assessment questionnaire has already been used in French PE context (Petiot & Desbiens, 2021). It allows to identify and rate the emotions daily experienced by students in PE. The emotions derived from the classification of Lazarus (1991) and the items are adapted from the Differential Emotions Scale (DES) of Izard, Dougherty, Bloxom and Kotsh (1974) validated for French population by Ricard-St-Aubin, Philippe, Beaulieu-Pelletier and Lecours (2010) (Fig. 1).

<b>In PE, how often do you ...</b>				
	<b>Never</b>	<b>Rarely</b>	<b>Often</b>	<b>Very often</b>
...feel <b>anger</b> in relation to situations experienced during PE	1	2	3	4
...feel <b>anxiety</b> in relation to situations experienced during PE	1	2	3	4
...feel <b>sadness</b> in relation to situations experienced during PE	1	2	3	4
...feel <b>shame</b> in relation to situations experienced during PE	1	2	3	4
...feel <b>pleasure</b> in relation to situations experienced during PE	1	2	3	4
...feel <b>pride</b> in relation to situations experienced during PE	1	2	3	4

**Fig. 1.** The questionnaire on emotions proposed to the students

The third section is the short French-Canadian version of Questionnaire on Teacher Interaction (QTI) validated by Lapointe and Legault (1999). It allowed to collect the students' perception of the PE teacher's interpersonal behavior. The QTI classifies behaviors according to two main dimensions: proximity and influence. It is composed of 32 items equally distributed over eight subscales (leadership, benevolence, indulgence, permissiveness, uncertainty, dissatisfaction, punishment, demand). The items are scored on a four-point ordinal scale (0: Totally disagree to 3: Totally agree). The QTI also allows the computation of two important constructs : *proximity* (opposition – cooperation axis) and *influence* (submission - domination axis). Those two constructs assumed to be orthogonal help to characterize the interpersonal style of each teacher.

In order to check for its applicability in the French context, a quasi-confirmatory factor analysis was performed with Factor. Before proceeding with the factor analysis, univariate distribution and multivariate asymmetry skewness and kurtosis analyses were conducted using the Shapiro-Wilk (Razali & Wah, 2011) and the Mardia (1970) tests. Both tests revealed significant ( $p = .000$ ) non-normal and skewed distributions of the ordinal data. For this reason, the robust diagonally weighted least squares (RDWLS) extraction method was chosen with polychoric correlations and a varimax rotation assuming orthogonality between the two constructs. Reliability was estimated using three internal consistency estimators: the greater lower bound (GLB), the omega (when a factor is composed of less than five items) and the ordinal Cronbach's alpha. A threshold of acceptability was established at .800, as recommended by Bourque, Doucet, LeBlanc, Dupuis and Nadeau (2019). The results obtained were not as expected. This greatly influenced our data analysis strategy. After the withdrawal of seven out of 32 items due to insufficient communalities ( $\leq .200$ ) (Yong & Pearce, 2013), insufficient loadings or significant cross-loadings (Matsunaga, 2010), a three-factor solution emerged with a total explained variance of 63,840%. The three factors are weakly but significantly correlated (Uncertainty – Dominance-Cooperation:  $r_s = -.289$ ,  $p = .000$ ; Uncertainty – Dominance-Opposition:  $r_s = .225$ ,  $p = .000$ ; Dominance-Opposition - Dominance-Cooperation:  $r_s = -.289$ ;  $p = .000$ ).

Factor 1 (39,48%) corresponds to the Domination-Opposition dimension. It is made up of 12 items related to three subscales: (a) *Demanding* (2. He/she is demanding; 10. His/her expectations are high; 18. He/she is severe in his/her feedback; 26. He/she is strict), (b) *Punishment* (4. He/she has bad temper; 12. He/she gets angry fast; 20. He/she is easy to get into conflict with; 30. He/she is impatient), and (c) *Dissatisfaction* (6. He/she thinks we do nothing good; 14. He/she looks dissatisfied; 22. He/she thinks we know little; 28. Sometimes he/she puts us down). The loadings range between .453 to .849 and the communalities vary between .208 to .802. The estimation of fidelity provided by the GLB is .930 and that of ordinal Cronbach's alpha is .940.

Factor 2 (15,68%) corresponds exclusively to the *Uncertainty* dimension. It is composed of four items (8. He/she sometimes acts as if he/she does not know what to do; 16. He/she sometimes look uncertain; 24. He/she sometimes appears hesitant; 32. He/she does not always know what to do when students are agitated). The loadings vary from .608 to .770, while the communalities vary from .385 to .684. The ordinal omega and ordinal Cronbach's alpha values for estimating reliability are both .810.

Factor 3 (8,68%) corresponds to the *Domination-Cooperation* dimension. It is composed of nine items related to benevolence (11. It is pleasant to come in his/her class; 19. He/she is a person you can count on; 27. He/she helps us a lot in our school activities and tasks), permissiveness (5. He/she understands us; 31. We can sometimes choose the task that is most interesting to us), and leadership (1. We learn many things with him/her; 9. He/she knows how to get our attention; 17. He/she explains things clearly; 25. He/she is able to manage is class well). The loadings vary between .614 to .731 and the communalities vary from .429 to .789. The estimation of fidelity provided by the GLB is .840 and that of ordinal Cronbach's alpha is .800.

The four fit indices selected according to Sun (2005) show an acceptable fit of the model to the data since the root mean square error of approximation (RMSEA) is  $.055 < .060$  (Schmitt, 2011), the comparative fit index (CFI) is  $.960 = .960$  (Schmitt, 2011), the non-normed fit index (NNFI) is  $.947 < .950$  (Cangur & Ercan, 2015), and the root mean square of residuals (RMSR) is  $.082 > .080$  (Browne & Cudeck, 1993). Based on the above, the decision was made to conduct the analysis with the three factors identified and the inherent limits of this conceptualization of teachers' interpersonal behaviors.

### *Statistical analysis*

A descriptive data analysis (absolute and relative frequencies) was first conducted to provide a concise portrait of the participants and of the distribution of their responses. After verifying the distribution of the data using the Shapiro-Wilk Test (Razali & Wah, 2011), it was decided to use non-parametric statistical techniques (Siegel & Castellan, 1988). The Mann-Whitney test was used to make comparisons between male and female participants for variables linked to PE class appreciation (item 4), emotions, and perceived teachers' interpersonal behaviors.

In a second step, a multiple correspondence analysis (MCA) (Desbois, 2008) was conducted to map the relationships between the selected ordinal and nominal variables. MCA is a multidimensional version of a correspondence factorial analysis (CFA). In addition to identifying the underlying dimensions linked to the interaction between the variables, the MCA represents their relationships using the distance between any given pair of points on a small graph. MCA is more dedicated to data exploration than to the confirmation of hypotheses, because it does not allow testing the degree of significance of the relationships between the

modalities of the variables. All statistical analyses were performed using SPSS software (Appache Software Foundation, version 15, 2006), XLStats software (Addinsoft, 1995-2009) and Factor 9.2 (Lorenzo-Seva & Ferrando, 2013). We used an alpha level of .05 for all statistical tests.

**Results**

*Boys' and girls' emotional experience in PE*

Almost a third of the students (n = 138; 32,9%) totally agreed with the statement “I enjoy the PE course”. Only 0,7 % (n = 3) of students said they are “Very often” sad in PE, while almost a quarter (n = 96; 23 %) feel “Very often” pleasure. A comparative analysis for the PE course appreciation and the six emotions studied reveals marked differences between male and female students. While they do not report significant differences in their experience of anger and sadness during PE classes, it is clear that the PE course is a source of greater enjoyment for boys than for girls (Table 2).

**Table 2.** Distribution of answers for the PE course appreciation and the six emotions

ITEM	I totally disagree (1)		I somewhat agree (2)		I totally agree (3)		I don't know / I have no opinion (4)		Comparison between boys' (B) and girls' (G)	
	f	f(%)	f	f(%)	f	f(%)	f	f(%)	U Mann-Whitney	Cohen's d
<b>ITEM 4.1 ENJOY THE PE COURSE</b>	38	9,1	215	51,3	138	32,9	28	6,7	B > G U = 15461.5, p = .000*	d = .511
EMOTIONS	Never (1)		Rarely (2)		Often (3)		Very often (4)		Comparison between boys' (B) and girls' (G)	
	f	f(%)	f	f(%)	f	f(%)	f	f(%)	U Mann-Whitney	Cohen's d
<b>ANXIETY</b>	224	53.7	142	34.1	34	8.2	17	4.1	B < G U = 17789.0, p = .001*	d = .315
<b>SHAME</b>	267	64.0	98	23.5	35	8.4	17	4.1	B < G U = 18881.5, p = .017*	d = .226
<b>PLEASURE</b>	40	9.6	86	20.6	195	46.8	96	23.0	B > G U = 15765.5, p = .000*	d = .485
<b>PRIDE</b>	64	15.4	158	38.0	144	34,6	50	12.0	B > G U = 15058.0, p = .000*	d = .547
<b>ANGER</b>	245	58.8	125	30.0	32	7.7	15	3.6	B = G U = 20441.0, p = .250	----
<b>SADNESS</b>	344	82.5	57	13.7	13	3.1	3	.7	B = G U = 20158.5, p = .258	----

*Boys' and girls' perception of teacher's interpersonal behavior*

When the teachers' interpersonal behaviors are examined, participants as a whole perceive teachers to be slightly more dominating and oppositional (46.9%) than dominating and cooperative (42.5%). Less than 15.0% believe they are uncertain (14.7%). With respect to teachers' interpersonal behaviors, no differences are reported between boys and girls concerning the Uncertainty and Domination-Cooperation dimensions, but boys tend to view their teachers as more dominant and oppositional (Table 3).

**Table 3.** Distribution of Frequency of Students' Responses According to Perceived Teachers' Interpersonal Behavior

FACTORS	Very low (1)		Low (2)		High (3)		Very high (4)		Comparison between boys' (B) and girls' (G)	
	f	f(%)	f	f(%)	f	f(%)	f	f(%)	U Mann-Whitney	Cohen's d
<b>1. UNCERTAINTY</b>	244	58.9	109	26.3	27	6.5	34	8.2	B = G U = 20402.0 p = .517	----
<b>2. DOMINATION-OPPOSITION</b>	100	25.2	111	28.0	77	19.4	109	27.5	B > G U = 17020.0 p = .028	d = .379
<b>3. DOMINATION-COOPERATION</b>	105	26.3	125	31.3	82	20.5	88	22.0	B = G U = 19120.0 p = .517	----

*Relation between students' emotional Experience in PE and perception of Teacher's Interpersonal Behavior*



or cooperative learning model (Goodyear, Casey & Kirk, 2012). Our research reveals that, regardless of the type of exercises and the way they are offered, the teachers could play an important role on girls' emotions, through their attitudes, words, and ways to interact (Bonniot-Paquien *et al.*, 2009; Nicaise *et al.*, 2007). The quality of the teacher-student relationship is related with strong positive and few negative emotions (Goetz *et al.*, 2021).

We now know that the appreciation of this relationship is related to sex and emotions. Indeed, our results highlight a clear sex-related association between students' perception of the teacher's interpersonal behaviors and emotions. Girls express a less positive appreciation of PE, experience positive emotions less frequently and perceive less favorably the teachers' interpersonal behaviors. They tend to perceive in their teacher a high degree of dominance and opposition, a moderate degree of uncertainty, and a lower degree of structure associated with cooperation. In a socio-cognitive emotion approach (Lazarus, 1991), the social environment is considered as the starting point of the emotions felt. We understand that girls, by receiving an unfavorable stimulus from their teachers, evaluate their interpersonal behaviors towards them, which may generate negative emotions.

### Conclusions

This study provides evidence to support an explanation for the recurring differences in scores between boys and girls in PE. Girls clearly experience more negative and less positive emotions than boys in the classroom. These emotions may interfere with their engagement, their learning, and their attraction to physical activity and sport. One of the levers to promote a positive emotional experience of boys and girls is the teacher's interpersonal behaviors. The results obtained highlight a very clear association between the sex, the emotions experienced in PE, and the teachers' interpersonal behaviors perceived by students.

However, this study has limitations which call for further research with stronger design. Firstly, the sample of students who participated in this research remains limited, even though it is larger than that of other studies referred to in this article. Secondly, in addition to the limit related to the utilization of single item to measure emotions, a second methodological and theoretical limit is worth considering: the results obtained about teachers' interpersonal behaviors cannot be interpreted according to the QTI's theoretical framework because the factor structure that was obtained did not allow for the computation of the proximity and influence constructs. Thirdly and lastly, this study was intended to describe, compare and establish statistical association patterns between variables. Let's insist on the fact that its design does not allow to confirm causal relations between independent and dependent variables.

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