



How many Physical Education hours do students desire? It depends on the (de-)motivating teaching style perceived

Javier García-Cazorla¹ , Sergio Diloy-Peña¹ , Carlos Mayo-Rota¹ ,
Luis García-González¹  & Ángel Abós¹ 

¹ Faculty of Health and Sport Sciences. Physical Education and Physical Activity Promotion Research Group (EFYPAF), University of Zaragoza, Huesca (Spain).



Cite this article

García-Cazorla, J., Diloy-Peña, S., Mayo-Rota, C., García-González, L. & Abós, A. (2024). How many Physical Education hours do students desire? It depends on the (de-)motivating teaching style perceived. *Apunts Educación Física y Deportes*, 156, 30-38. [https://doi.org/10.5672/apunts.2014-0983.es.\(2024/2\).156.04](https://doi.org/10.5672/apunts.2014-0983.es.(2024/2).156.04)

Abstract

A more integrative and fine-grained model called circumplex approach, which classifies (de-)motivating teaching style into eight (de-)motivating approaches based on the degree of need support/thwarting and directiveness, has recently been proposed in the educational context. However, the evidence so far on how each of (de-)motivating teaching approaches may be related to different (mal-)adaptive outcomes is scarce in the PE context. Grounded in this circumplex model, the present study aims to examine differences in the number of PE hours desired by students in terms of students' perceptions of (de-)motivating teaching approaches. An intentional sample of 669 secondary students ($M_{age} = 14.65$; $SD = 1.47$; 52 % girls), aged between 12 and 17 years participated in this cross-sectional study. The results show that students who would like to have more and the same desired PE hours as usual reported perceived significantly higher values in participative, attuning, guiding, clarifying, and demanding approaches from their PE teachers than those who desired fewer PE hours than usual. In addition, students who reported fewer desired PE hours than usual perceived significantly higher values in the abandoning approach from their PE teachers in comparison with students who desired more and the same PE hours. Results highlighted the importance of PE teachers developing autonomy-supportive and structuring approaches (i.e., participative, attuning, guiding, and clarifying) and avoiding chaotic approaches (i.e., abandoning) to foster adaptive students' affective outcomes.

Keywords: circumplex model, desired PE hours, self-determination theory, teaching approaches.

Editor:

© Generalitat de Catalunya
Departament de la Presidència
Institut Nacional d'Educació
Física de Catalunya (INEFC)

ISSN: 2014-0983

*Corresponding author:

Sergio Diloy-Peña
sdiloy@unizar.es

Section:

Physical Education

Original language:

English

Received:

July 10, 2023

Accepted:

October 27, 2023

Published:

April 1, 2024

Front cover:

Mountain biker enjoying
nature and open air.
© Adobe Stock. Delcio F/
peopleimages.com

Introduction

Increasing the number of Physical Education (PE) lessons may contribute, among other purposes, to increasing the amount of physical activity (PA) that pupils engage in each week. According to data from a 2016 global study, more than 80% of adolescents aged 11-17 years did not meet current daily PA recommendations, compromising their current and future health (Guthold et al., 2020). So, by increasing the number of PE hours and therefore PA per week the students would develop physical, psychological, and cognitive benefits (Biddle et al., 2019; Poitras et al., 2016; Ramires et al., 2023). Previous research has highlighted the role of PE teachers, via their (de-)motivating teaching style, as one of the most important factors for the development of positive experiences, knowledge, and values necessary to facilitate a healthy lifestyle in their students (Diloy-Peña et al., 2021; Vasconcellos et al., 2020).

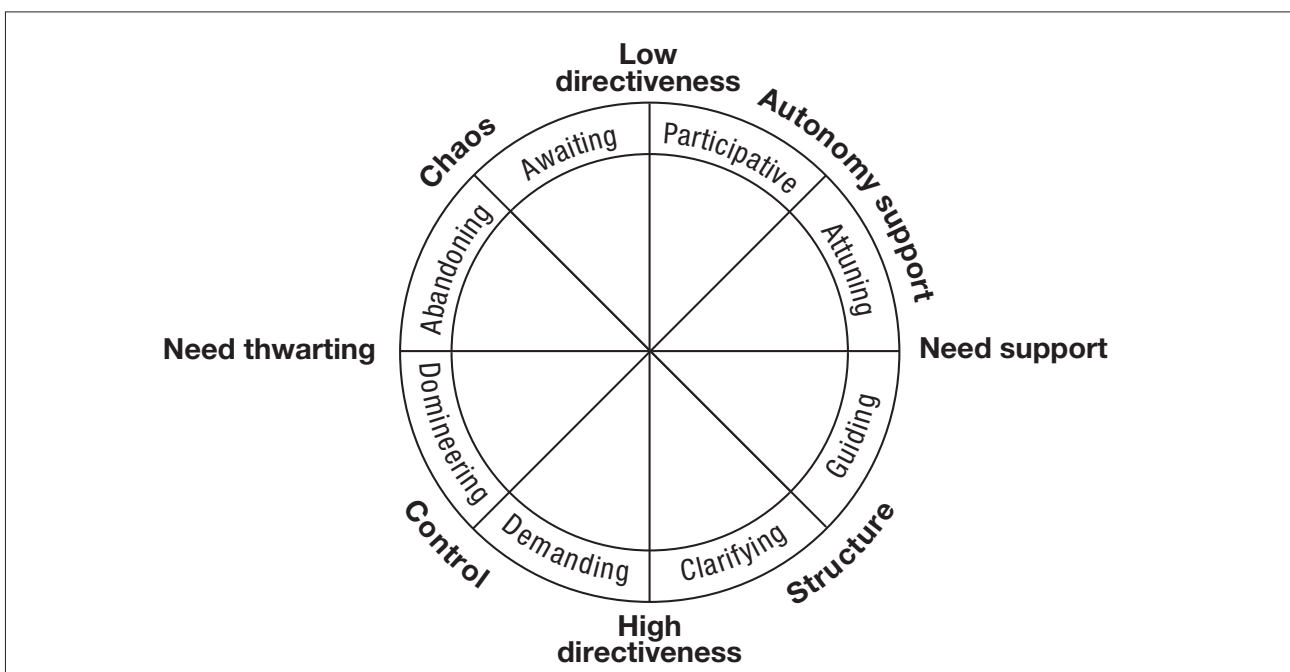
Recently, within the Self Determination Theory framework (SDT; Ryan & Deci, 2017) a more integrative and detailed conceptualization of (de-)motivating teaching styles called circumplex model has been proposed (Aelterman et al., 2019), which differentiates among eight teaching approaches that draw a circular structure in terms of the level of directiveness, and support or thwarting of basic psychological needs (BPN). Aelterman et al. (2019) argued that this circular structure more accurately captures the complexity and interaction between different (de-)motivating styles. This circular structure also allows for the identification and analysis of teaching approaches that may have been overlooked or underestimated in more unidimensional

classification systems. Although the circumplex approach represents a relevant advance in the study of (de-)motivating teaching style, little, if any, is still known about how the eight (de-)motivating teaching approaches may impact a set of students' outcomes (Aelterman et al., 2019; Burgueño et al., 2023; Escrive-Boulley et al., 2021). For example, there is no previous research that has explored the student's desired PE hours and if this could differ according to eight teachers' (de-)motivating approaches. To overcome this existing gap and to extend previous evidence on (de-)motivating teaching style on the circumplex approach in PE, the present study aims to examine differences in the number of PE hours desired by students concerning students' perception of (de-)motivating teaching approaches.

(De-)motivating teaching styles based on the circumplex approach

Building upon SDT (Ryan & Deci, 2017), Aelterman et al. (2019) in the educational context, and, specifically in PE context (Burgueño et al., 2023; Escrive-Boulley et al., 2021) forwarded a more integrative and fine-grained circumplex approach in which four (de-)motivating teaching styles (i.e., autonomy support, structure, control, and chaos) and eight (de-)motivating teaching approaches (i.e., participative, attuning, guiding, clarifying, demanding, domineering, abandoning, and awaiting) can be distinguished depending on the level of directiveness (i.e., high or low) and support or thwarting of BPN used by teachers to interact with students (see Figure 1).

Figure 1
Circumplex approach to (de-)motivating styles by Aelterman et al. (2019).



The first (de-)motivating teaching style, characterized by a low level of directiveness and a high level of need-support is autonomy support (i.e., PE teacher understands students' interests, feelings, and preferences), which is composed of participative and attuning approaches. Particularly, a participative PE teacher wants to identify the personal interests of his or her students, listen to their suggestions, and try to provide meaningful dialogue so that students can develop their learning. An attuning PE teacher tries to find and offer options to make tasks more interesting and enjoyable, thus increasing students' interest and providing a meaningful rationale for each task performed (Aelterman et al., 2019; Escrivá-Boulley et al., 2021). The second (de-)motivating teaching style, characterized by a high level of directiveness and a high level of need-support, is structure (i.e., PE teacher knows the capabilities and abilities of their students and assist them in their learning), which is composed of guiding and clarifying teaching approaches. A guiding PE teacher helps students to progress in their learning through constructive, clear, and valuable feedback as well as by guiding them to complete tasks in different steps. A clarifying PE teacher reports an overview of the student's expectations and communicates guidelines clearly and transparently (Aelterman et al., 2019; Escrivá-Boulley et al., 2021).

The third (de-)motivating teaching style, characterized by a high level of directiveness and a high level of need-thwarting, is control (i.e., teacher pressures and forces students to think, feel, and behave in a certain way), which is composed by demanding and domineering approaches. A demanding PE teacher requires discipline from students by using controlling language to make clear what students must do, for instance, the PE teacher does not tolerate any contradiction and threatens punishments or sanctions if the students do not comply. A domineering PE teacher pressures students to comply with these requests by inducing feelings of guilt, inferiority, disappointment, and shame (Aelterman et al., 2019; Escrivá-Boulley et al., 2021). The last (de-)motivating teaching style, characterized by a low level of directiveness and a high level of need-thwarting, is chaos (i.e., the teacher allows the students to learn independently with no clear guidelines), which is composed of abandoning and awaiting approaches. An abandoning teacher disengages with students after several attempts, moving on to the next task without respecting the individual needs of each student, because he or she understands that they must learn to take responsibility. An awaiting PE teacher gives full initiative for action to the students, setting vague and diffuse goals and tasks (Aelterman et al., 2019; Escrivá-Boulley et al., 2021).

(De-)motivating teaching styles and students' outcomes in PE

A substantial body of SDT-based research in PE has shown how teachers' (de-)motivating teaching styles are related to a wide range of students' (mal-)adaptive outcomes (Vasconcellos et al., 2020; White et al., 2021). For example, a meta-analysis study conducted by Vasconcellos et al. (2020) showed that both autonomy-supportive and structuring styles of PE teachers have been positively related to a range of positive affective (e.g., PE experiences), cognitive (e.g., learning-related outcomes), and behavioral (e.g., intention to be physically active) outcomes and negatively, to a lesser extent, to maladaptive outcomes. Likewise, another review about the impact of SDT on students' outcomes in PE lessons by Sun et al. (2017) showed that students who perceived motivating teaching styles of their PE teachers revealed positive motivational outcomes, such as interest, effort, enjoyment, satisfaction, engagement, high participation, and intention to future PE enrollment. However, past and recent SDT-related evidence in PE has shown that both controlling and chaotic styles are related to a long set of maladaptive outcomes, such as students' disaffection in PE (Curran & Standage, 2017) and need frustration (Burgueño et al., 2022; Burgueño & Medina-Casabón, 2021).

The Present Study

Even though an increasing body of research is focusing on these four (de-)motivating teaching styles in different contexts (Aelterman et al., 2019; Delrue et al., 2019; Escrivá-Boulley et al., 2021), very little attention, so far, has been paid to identifying possible outcomes of the different teaching approaches (i.e., participative, attuning, guiding, clarifying, demanding, domineering, abandoning, and awaiting) that encompass each teaching style in PE context, knowing in more detail how each of the eight (de-)motivating teaching approaches is associated with positive outcomes, as the desired PE hours, which, to the best of our knowledge, is still unexplored. Thus, this could provide more refined evidence about how teachers' behavior impacts on students' PE predisposition and PA intentions. Therefore, grounded in SDT (Ryan & Deci, 2017), and the circumplex model (Burgueño et al., 2023; Escrivá-Boulley et al., 2021), the present study aims to examine differences in students' perceptions of different (de-)motivating teaching approaches in terms of students' desired PE hours. In line with previous SDT-based research in PE (Vasconcellos et al., 2020; White et al., 2021) and the circumplex model (Burgueño et al., 2023; Escrivá-Boulley et al., 2021), students who report more desired PE hours are expected to show higher scores

of participative, attuning, guiding, and clarifying approaches of their PE teachers, and fewer demanding, domineering, abandoning, and awaiting approaches, compared to students who report a desire of having less PE hours than usual.

Material and Methods

Design and Participants

The present study was based on a cross-sectional design. An intentional, non-probability sample of 669 students ($M_{\text{age}} = 14.65$; $SD = 1.47$; 52 % girls; divided in Year 8 = 198; Year 9 = 161; Year 10 = 141; Year 11 = 102; Year 12 = 68), from different secondary schools in north-eastern Spain, more specifically in the Community of Aragon, was used after removing invalid data. The criteria for inclusion were to belong to the schools where the study was developed, to have the informed parental consent form signed, and to fill in the corresponding questionnaires correctly. Participants were taught by a total of 10 PE teachers ($M_{\text{age}} = 38.56$; $SD = 7.18$; 20 % female) who had an average of teaching experience of 10.77 ± 7.01 years. While PE teachers involved in this research did not receive any specific training about (de-)motivating teaching practices, they previously obtained at least a Bachelor of Science in Physical Activity and Sport Sciences and a Professional Master's program in Education. Besides, in the Spanish educational context, more specifically in secondary education, PE is a compulsory subject, in which students receive two lessons of approximately 50 minutes per week.

Instruments and Variables

(De-)motivating teaching style

Students' perceptions of PE teachers' (de-)motivating approaches were assessed using the student Spanish version of the School Situations Questionnaire in PE (SIS-PE; Burgueño et al., 2023). The SIS-PE presents 12 situations with four distinct items (i.e., 48 items in total) for each one that usually takes place in PE lessons. Each one of the 48 items corresponds to one of the eight (de-)motivating teaching approaches that the circumplex model encompasses. More precisely, four items refer to participative, eight to attuning, seven to guiding, five to clarifying, seven to demanding, five to domineering, eight to abandoning, and four to awaiting approaches (for further information on each item, please see the SIS-PE questionnaire in Burgueño et al., 2023. Responses were given on a Likert scale from 1 ("does not describe my PE teacher at all") to 7 ("describes my PE

teacher extremely well"). In the present study, confirmatory factor analysis (CFA) showed a good fit to the data: $\chi^2 (3.673, n = 669) = 3945.463, p < .001$; CFI = 0.906; TLI = 0.901; RMSEA = 0.064; 90 % CI = 0.061-0.066.

Desired PE hours

Students' perceptions of the desired number of PE hours were assessed using the question: "How many hours of PE would you like to have per week?". Because the Spanish Educational Legislation states that secondary students must have at least 2 hours of PE per week, we decided to categorize the answers into 3 options: "less than usual (i.e., < 2 h/week)", "the same hours (i.e., 2 h/week)", or "more hours than usual (i.e., > 2 h/week)".

Procedure

Before starting the study, the main researcher contacted the schools' boards and PE teachers to inform them about the objectives and request their participation. Next, families or legal guardians were asked to sign the informed consent form to agree to their children's participation. The questionnaires were completed in a paper-pencil format in approximately 15 minutes, in a quiet environment with a suitable temperature. During the development of the questionnaires, the main researcher was available to answer any questions, while the PE teachers were not present so as not to distort their answers. In addition, with the aim of reducing the potential bias of social desirability in responses, students were reminded that the data were confidential and anonymous and would only be used for research purposes, remarking the importance of honesty in their responses. Before starting the questionnaire, participants, who did not receive any remuneration for their participation, were informed that participation was voluntary and that, if they wished, they could leave the research at any time. Ethical clearance for this research was secured through the Institutional Research Ethics Committee of the first author's affiliated university (CEICA; PI15/0283).

Data Analysis

In preliminary analyses, descriptive statistics (means and standard deviations), composite reliability (via McDonald's omega coefficient), and bivariate correlations (Pearson's for continuous variables and Spearman's Rho for PE desired hours) were calculated for all study variables. Regarding composite reliability, scores above 0.80 could be needed when comparing among groups (Viladrich et al., 2017), although there are also other references that lower Omega's threshold to 0.70 (Nunnally, 1978). Prior to the MANOVA test, the normality of the data was assessed through the values of

skewness and kurtosis. Then, homoscedasticity was checked by Levene's test ($p > .05$). Also, we have controlled the data independence by Pearson's chi-square test ($p > .05$), so the data were independent from each other (Field, 2017). In the main analyses, we performed a multivariate analysis of variance (MANOVA) of students' perceptions of PE teachers' (de-)motivating teaching approaches according to the number of desired PE hours. In all analyses, if significant differences were found, *post hoc* tests were performed using the Bonferroni method, which is useful to control Type I error when making multiple simultaneous comparisons (Field, 2017). The level of statistical significance was set at $p < .05$. Effect sizes (η^2p) of .01 were considered low, above .06 moderate, and .14 high. All analyses were conducted using SPSS v25 software.

Results

Means, standard deviations, reliability, and correlations between study variables are presented in Table 1. As observed, students reported higher mean scores than the midpoint of the scale in six of the eight (de-)motivating teaching approaches of their PE teachers, only except for abandoning and awaiting approaches, which showed lower

mean scores than the midpoint. Correlations revealed that most of the (de-)motivating teaching approaches correlated significantly with each other, ranging from $r = -.33$ (i.e., guiding with abandoning) to $r = .76$ (i.e., attuning with guiding). Participative, attuning, guiding, clarifying, and demanding approaches were related positively and significantly to the number of PE hours desired by students.

More related to the main aim of this research, differences in students' perceptions of PE teaching approaches regarding desired PE hours are reported in Table 2. The multivariate effect of the students' desired PE hours on (de-)motivating teaching approaches (Wilks' $\lambda = 0.942$, $F(16,132) = 2.51$, $p < .001$, $\eta^2p = .030$) was significant. Students who would like to have more (i.e., > 2 h/week) and the same PE hours as usual (i.e., 2 h/week) perceived significantly higher values of participative, attuning, guiding, clarifying, and demanding approaches compared to students who reported fewer desired PE hours than usual (i.e., < 2 h/week). On the other hand, students who revealed fewer desired PE hours (i.e., < 2 h/week) perceived significantly higher values of abandoning approach from their PE teachers, compared to those who would like to have more (i.e., > 2 h/week) and the same PE hours than usual (i.e., 2 h/week).

Table 1

Descriptive statistics, reliability, and correlations among study variables.

Variables	Range	M (SD)	Omega (ω)	1	2	3	4	5	6	7	8	9
1. Participative	1-7	4.01 (1.50)	.72	-	.73**	.61**	.52**	.42**	.21**	-.06	.01	.12**
2. Attuning	1-7	4.60 (1.27)	.83		-	.77**	.70**	.51**	.18**	-.24**	-.07	.15**
3. Guiding	1-7	5.18 (1.22)	.84			-	.70**	.55**	.12**	-.33**	-.16**	.13**
4. Clarifying	1-7	5.22 (1.08)	.67				-	.59**	.22**	-.22**	-.11**	.09**
5. Demanding	1-7	4.75 (0.97)	.59					-	.44**	-.01	.04	.12**
6. Domineering	1-7	3.77 (1.19)	.57						-	.43**	.27**	.07
7. Abandoning	1-7	2.56 (1.24)	.82							-	.57**	-.02
8. Awaiting	1-7	2.63 (1.29)	.67								-	-.04
9. PE desired hours ^a	1-3	2.65 (1.31)	-									-

Nota. * $p < .05$; ** $p < .01$; a = Spearman's rho correlation.

Table 2
Differences in students' perceptions of PE teaching approaches in terms of the desired PE hours.

	Number of desired PE hours						Contrast between groups					
	< 2 h/week (i) (n = 51)		2 h/week (j) (n = 130)		> 2 h/week (k) (n = 488)		Mean difference	Standard error	p	F-value ^(2,487)	η ² p	
	M	SD	M	SD	M	SD						
Participative	3.304	.210	3.960	.131	4.108	.068	i-j	-.656	.247	.025	6.782	.020
							i-k	-.804	.220	.001		
							j-k	-.148	.148	.950		
Attuning	3.710	.174	4.563	.109	4.712	.056	i-j	-.853	.206	< .001	15.039	.043
							i-k	-1.002	.183	< .001		
							j-k	-.149	.123	.681		
Guiding	4.364	.168	5.121	.105	5.284	.054	i-j	-.757	.198	< .001	13.840	.040
							i-k	-.920	.176	< .001		
							j-k	-.163	.118	.503		
Clarifying	4.718	.150	5.182	.094	5.289	.049	i-j	-.464	.177	.027	6.693	.020
							i-k	-.572	.158	.001		
							j-k	-.108	.106	.926		
Demanding	4.297	.136	4.727	.085	4.810	.044	i-j	-.431	.160	.022	6.527	.019
							i-k	-.513	.143	.001		
							j-k	-.083	.096	1.000		
Domineering	3.788	.168	3.688	.106	3.789	.054	i-j	.101	.198	1.000	0.376	.001
							i-k	-.001	.176	1.000		
							j-k	-.102	.118	1.000		
Abandoning	3.078	.173	2.565	.108	2.516	.056	i-j	.513	.204	.037	4.790	.014
							i-k	.563	.182	.006		
							j-k	.050	.122	1.000		
Awaiting	2.897	.181	2.523	.113	2.641	.058	i-j	.374	.213	.240	1.543	.005
							i-k	.256	.190	.533		
							j-k	-.118	.127	1.000		

Discussion

Although recent research in different contexts has shown that different (de-)motivating teaching styles can trigger a wide range of students' outcomes (Vasconcellos et al., 2020), research in PE is still scarce so far. This is the first research to date that focuses on the differences in students' desired PE hours about the students' perception of eight (de-)motivating teaching approaches, getting a more detailed view of the circumplex approach in PE. The present study, therefore, expands prior evidence in SDT-based research in PE by displaying two main findings: (1) students who desire more PE hours perceive their PE teachers as more need-supportive and directive (i.e., participative, attuning, guiding, clarifying, and demanding); (2) students who desire fewer PE hours perceive their PE teachers to be chaotic, especially with more traits of an abandoning approach.

Consistent with our research hypothesis, our results displayed that those students who desired more (i.e., > 2 h/week) or the same (i.e., 2 h/week) PE hours perceived significantly higher values for participative, attuning, guiding, and clarifying approaches from their PE teachers. These results are in line with previous SDT-based research (Burgueño et al., 2022; Curran & Standage, 2017; Vasconcellos et al., 2020) which showed that students' perceptions of autonomy-supportive (i.e., participative and attuning) and structuring (i.e., guiding and clarifying) styles were positively related to a wide range of motivational and behavioral adaptive outcomes (e.g., PA levels, engagement, among others). These results suggest that those PE teachers who offer students the opportunity for choice in the organization and delivery of the lessons (i.e., participative), explaining the usefulness of the tasks and adjusting them according to the students' wishes and preferences (i.e., attuning) may be more likely to arouse in their students a higher predisposition towards PE (Vasconcellos et al., 2020). Likewise, PE teachers who structure tasks in different steps and provide constructive, clear, and valuable feedback, addressing personal students' characteristics (i.e., guiding), and communicating learning objectives and goals (i.e., clarifying), also tend to report students' adaptive outcomes (Aelterman et al., 2019; Vasconcellos et al., 2020), triggering a greater desire to do and participate among students in the PE classes.

Regarding PE teachers' controlling style, our results showed that students who desired more (i.e., > 2 h/week) or the same (i.e., 2 h/week) PE hours perceived significantly higher values for the demanding approach. The results found are not totally in line with our hypothesis and previous SDT-related research in PE (Curran & Standage, 2017), which, overall, has shown how PE teachers' controlling style tends to trigger maladaptive outcomes, such as students'

disaffection. A potential explanation for this result is that the demanding approach (i.e., controlling style) from PE teachers could be perceived by students as very close to clarifying approach (i.e., structuring style), as it is small nuances that differentiate both approaches characterized by a high directiveness (Aelterman et al., 2019). The results of the correlation analysis, as occurs in other studies based on the circumplex approach (Aelterman et al., 2019) show a significant and positive relationship between demanding and clarifying approaches. This could mean that, at least for some positive outcomes such as the predisposition towards PE, some nuances of teacher control (i.e., demanding approach) closer to the structure style (i.e., clarifying approach) may work as fuel to trigger adaptive outcomes. However, a recent study in PE has shown how the demanding approach from PE teachers, in parallel, can facilitate students' need-frustration (Burgueño et al., 2023). In this sense, it seems important that if PE teachers are characterized by conducting their lessons with high directiveness, it is characterized by traits of clarifying rather than demanding approach (Burgueño et al., 2023). Therefore, these results should be to increase the interest to investigate more about the relationship between the controlling style, specifically the demanding approach, with (mal-)adaptive students' outcomes.

Finally, the results of the present study also revealed that students who desired fewer PE hours (i.e., < 2 h/week) perceived higher values of abandoning approach (i.e., chaos) from their PE teachers. These results are in line with previous studies based on the circumplex approach in the sport context (Delrue et al., 2019) in which chaos from coaches was related to youth athletes' need for frustration. Similarly, our results are aligned with another recent SDT-based study which showed that students' perception of chaotic style was negatively related to behavioral and emotional engagement (Leo et al., 2022). In this vein, our results seem to point out that when PE teachers give up and leave students in their classroom (i.e., abandoning approach), students' desire to do PE decreases, probably because they do not know what to do, how they should act, and how they can develop their abilities and capabilities. Yet, it is important to note that students who wanted fewer PE hours did not perceive a higher level of awaiting approach from their PE teacher. Although both chaos approaches are highly detrimental (Burgueño et al., 2023; Delrue et al., 2019) this would mean that students would be likely to feel less desire to do PE, when they perceive that their PE teacher adopts a chaotic tone characterized by higher levels of need-thwarting (i.e., abandoning approach) than when that chaos moves towards a tone relied more on *laissez-faire* with low levels of directiveness (i.e., awaiting approach).

Implications for teaching practice

The results suggest the need to develop specialized training programs for pre- and in-service PE teachers. These programs should focus on equipping PE teachers with the necessary skills and knowledge to employ depending on several factors (e.g., students' age, content, class size, among others), need-supportive approaches with distinct levels of directiveness. Specifically, if PE teachers desire that their students have a high PE predisposition, they should be encouraged to adopt autonomy-supportive teaching methods (Pérez-González et al., 2019). More precisely, this involves providing students with choices and involving them in decision-making (i.e., participative), as well as recognizing their perspectives and preferences and trying to provide a meaningful rationale for each task performed (i.e., attuning) (Aelterman et al., 2019). Likewise, there is ample evidence that shows how structuring approaches could trigger an adaptive motivational process in students, including having a desire for more PE (Vasconcellos et al., 2020). More specifically, PE teachers should also seek to orient and guide their students in the teaching process (i.e., guiding), as well as to define the objectives clearly and in detail (i.e., clarifying) (Escriba-Boulley et al., 2021). Teachers can be trained to strike a balance between providing structure and allowing students to have a say in their PE lesson activities, which can boost their participation, effort, and engagement, among others (Burgueño et al., 2023). Furthermore, it seems that some control traits such as using a certain tone of power with students (i.e., demanding), could have a positive PE predisposition effect among students, at least in the short term. However, given the numerous negative evidence on teachers' control behavior, we prefer not to make recommendations in this regard for the moment and encourage continuing to examine the effects of the demanding and specially domineering approaches separately. Finally, training programs should highlight the negative impact of disorganized teaching approaches on students' adaptive outcomes in PE lessons, especially the abandoning approach.

Limitations and Future Directions

Although our findings expand previous evidence of the circumplex approach in PE, it is also important to indicate limitations and future directions. First, the design of this study is cross-sectional, so no causal relationships between the study variables can be inferred. Future longitudinal and/or experimental research is, thus, required to shed more light on the associations of (de-)motivating approaches with students' outcomes over time. Second, the sampling of this study was non-probabilistic (i.e., intentional sample), so the results should be interpreted with caution. Future

studies based on the circumplex model in PE should use a probability sampling method to increase external validity. Third, the reliability of some (de-)motivating approaches was slightly under the threshold, so it is important to be cautious when interpreting results. Fourth, PE teachers' (de-)motivating teaching styles were measured based on students' perceptions, which may imply self-report bias and social desirability in their measurement. Future studies should use other sources of information (e.g., observation, teacher perceptions, etc.), for a triangulation of data. Finally, the present study only considered one outcome (i.e., the number of PE hours desired by students). Moreover, this variable was evaluated with a single item and therefore, reliability cannot be analyzed, so results should be interpreted with caution. Future research may include another type of outcome (e.g., affective, cognitive, or behavioral) and use instruments that capture better the meaning of the variable to draw a more complete picture of the relationship between the eight (de-)motivating teaching approaches proposed by the circumplex approach and the students' motivational process.

Conclusions

The present study expands previous PE research based on the circumplex model by displaying how some (de-)motivating approaches may be associated with a greater desire to do PE among students. More precisely, the present study indicates that PE teachers should make more use of motivating teaching approaches that support students' needs (i.e., participative, attuning, guiding, and clarifying). Besides, given the positive results of the demanding approach associated with this desire for more PE hours, there is a need to examine which could be the optimal amount, if any, of controlling style to achieve adaptive outcomes in the PE classes. Finally, this study indicates the need for PE teachers to avoid the chaotic style, and more specifically abandoning approaches, as these are the worst performers in terms of the number of hours of PE desired by students.

References

- Aelterman, N., Vansteenkiste, M., Haerens, L., Soenens, B., Fontaine, J. R. J., & Reeve, J. (2019). Toward an integrative and fine-grained insight in motivating and demotivating teaching styles: The merits of a circumplex approach. *Journal of Educational Psychology*, 111(3), 497-521. <https://doi.org/10.1037/edu0000293>
- Biddle, S. J. H., Ciaccioni, S., Thomas, G., & Vergeer, I. (2019). Physical activity and mental health in children and adolescents: An updated review of reviews and an analysis of causality. *Psychology of Sport and Exercise*, 42, 146-155. <https://doi.org/10.1016/j.psychsport.2018.08.011>
- Burgueño, R., Abós, Á., Sevil-Serrano, J., Haerens, L., De Cocker, K., & García-González, L. (2023). A Circumplex Approach to (de)motivating Styles in Physical Education: Situations-In-School-Physical Education Questionnaire in Spanish Students, Pre-Service, and In-Service Teachers. *Measurement in Physical Education and Exercise Science*, 1-23. <https://doi.org/10.1080/1091367X.2023.2248098>

- Burgueño, R., García-González, L., Abós, Á., & Sevil-Serrano, J. (2022). Students' motivational experiences across profiles of perceived need-supportive and need-thwarting teaching behaviors in physical education. *Physical Education and Sport Pedagogy*, 1-15. <https://doi.org/10.1080/17408989.2022.2028757>
- Burgueño, R., & Medina-Casaubón, J. (2021). Validity and reliability of the interpersonal behaviors questionnaire in physical education with Spanish secondary school students. *Perceptual and Motor Skills*, 128(1), 522-545. <https://doi.org/10.1177/0031512520948286>
- Curran, T., & Standage, M. (2017). Psychological Needs and the Quality of Student Engagement in Physical Education: Teachers as Key Facilitators. *Journal of Teaching in Physical Education*, 36(3), 262-276. <https://doi.org/10.1123/jtpe.2017-0065>
- Delrue, J., Reynders, B., Broek, G. V., Aelterman, N., De Backer, M., Decroos, S., De Muynck, G. J., Fontaine, J., Franssen, K., van Puyenbroeck, S., Haerens, L., & Vansteenkiste, M. (2019). Adopting a helicopter-perspective towards motivating and demotivating coaching: A circumplex approach. *Psychology of Sport and Exercise*, 40, 110-126. <https://doi.org/10.1016/j.psychsport.2018.08.008>
- Diloy-Peña, S., García-González, L., Sevil-Serrano, J., Sanz-Remacha, M., & Abós, A. (2021). Motivating teaching style in Physical Education: how does it affect the experiences of students? *Apunts Educación Física y Deportes*, 144, 44-51. [https://doi.org/10.5672/apunts.2014-0983.es.\(2021/2\).144.06](https://doi.org/10.5672/apunts.2014-0983.es.(2021/2).144.06)
- Escriba-Boulley, G., Guillet-Descas, E., Aelterman, N., Vansteenkiste, M., Van Doren, N., Lentillon-Kaestner, V., & Haerens, L. (2021). Adopting the situation in school questionnaire to examine Physical Education teachers' motivating and demotivating styles using a circumplex approach. *International Journal of Environmental Research and Public Health*, 18(14), 7342. <https://doi.org/10.3390/ijerph18147342>
- Field, A. (2017). *Discovering Statistics Using IBM SPSS Statistics*. SAGE Publications.
- Guthold, R., Stevens, G. A., Riley, L. M., & Bull, F. C. (2020). Global trends in insufficient physical activity among adolescents: a pooled analysis of 298 population-based surveys with 1.6 million participants. *The Lancet Child & Adolescent Health*, 4(1), 23-35. [https://doi.org/10.1016/S2352-4642\(19\)30323-2](https://doi.org/10.1016/S2352-4642(19)30323-2)
- Leo, F. M., Pulido, J. J., Sánchez-Oliva, D., López-Gajardo, M. A., & Mouratidis, A. (2022). See the forest by looking at the trees: Physical education teachers' interpersonal style profiles and students' engagement. *European Physical Education Review*, 28(3), 720-738. <https://doi.org/10.1177/1356336X221075501>
- Nunnally, J. C. (1978). *An Overview of Psychological Measurement*. In *Clinical Diagnosis of Mental Disorders* (pp. 97-146). Springer US. https://doi.org/10.1007/978-1-4684-2490-4_4
- Pérez-González, A. M., Valero-Valenzuela, A., Moreno-Murcia, J. A., & Sánchez-Alcaraz, B. J. (2019). Revisión sistemática del apoyo a la autonomía en educación física. *Apunts Educación Física y Deportes*, 138, 51-61. [https://doi.org/10.5672/apunts.2014-0983.es.\(2019/4\).138.04](https://doi.org/10.5672/apunts.2014-0983.es.(2019/4).138.04)
- Poitras, V. J., Gray, C. E., Borghese, M. M., Carson, V., Chaput, J.-P., Janssen, I., Katzmarzyk, P. T., Pate, R. R., Connor Gorber, S., Kho, M. E., Sampson, M., & Tremblay, M. S. (2016). Systematic review of the relationships between objectively measured physical activity and health indicators in school-aged children and youth. *Applied Physiology, Nutrition, and Metabolism*, 41(6 (Suppl. 3)), S197-S239. <https://doi.org/10.1139/apnm-2015-0663>
- Ramires, V. V., dos Santos, P. C., Barbosa Filho, V. C., Bandeira, A. S., Marinho Tenório, M. C., de Camargo, E. M., Ravagnani, F. C. P., Sandreschi, P., de Oliveira, V. J. M., Hallal, P. C., & Silva, K. S. (2023). Physical Education for Health Among School-Aged Children and Adolescents: A Scoping Review of Reviews. *Journal of Physical Activity and Health*, 1-14. <https://doi.org/10.1123/jpah.2022-0395>
- Ryan, R. M., & Deci, E. L. (2017). *Self-Determination Theory: Basic Psychological Needs in Motivation, Development, and Wellness*. R. M. Ryan & E. L. Deci (eds.). Guilford Press. <https://doi.org/10.1521/978.14625/28806>
- Sun, H., Li, W., & Shen, B. (2017). Learning in Physical Education: A Self-Determination Theory Perspective. *Journal of Teaching in Physical Education*, 36(3), 277-291. <https://doi.org/10.1123/jtpe.2017-0067>
- Vasconcellos, D., Parker, P. D., Hilland, T., Cinelli, R., Owen, K. B., Kapsal, N., Lee, J., Antczak, D., Ntoumanis, N., Ryan, R. M., & Lonsdale, C. (2020). Self-determination theory applied to physical education: A systematic review and meta-analysis. *Journal of Educational Psychology*, 112(7), 1444-1469. <https://doi.org/10.1037/edu0000420>
- Viladrich, C., Angulo-Brunet, A., & Doval, E. (2017). A journey around alpha and omega to estimate internal consistency reliability. *Anales de Psicología/Annals of Psychology*, 33(3), 755-782. <https://doi.org/10.6018/analesps.33.3.268401>
- White, R. L., Bennie, A., Vasconcellos, D., Cinelli, R., Hilland, T., Owen, K. B., & Lonsdale, C. (2021). Self-determination theory in physical education: A systematic review of qualitative studies. *Teaching and Teacher Education*, 99, 103247. <https://doi.org/10.1016/j.tate.2020.103247>

Conflict of Interests: No conflict of interest was reported by the authors.



© Copyright Generalitat de Catalunya (INEFC). This article is available at the URL <https://www.revista-apunts.com/en/>. This work is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License. The images or other third party material in this article are included in the article's Creative Commons license, unless indicated otherwise in the credit line; if the material is not included under the Creative Commons license, users will need to obtain permission from the license holder to reproduce the material. To view a copy of this license, visit <http://creativecommons.org/licenses/by-nc-nd/4.0/>