

Teaching action and altruistic behaviour in Physical Education classes. Predictive analysis applying the 3×2 motivational climate model

Acción docente y comportamiento altruista en clases de Educación Física. Un análisis predictivo desde el modelo de clima motivacional 3×2

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Abstract:

This study aims to identify the way in which the motivational climate generated by Physical Education (PE) teachers influences engagement in prosocial-altruistic behaviour in a sample of 714 12-to-18-year-old Spaniards adolescents. To this end, the following objectives were proposed: (1) to identify the types of motivational climates established by teachers in PE classes and their impact on facilitating or limiting student engagement in altruistic prosocial behaviours, and (2) to examine the existence of gender differences and describe whether they are also influenced by

the climates generated by teachers. A descriptive, non-randomized and relational research design was employed. The students were applied instruments for the 3 × 2 motivational climate and prosocial behavior in relation to their experiences in physical education classes. Findings reveal that an other-oriented climate, whether approach or avoidance oriented, reduces engagement in altruistic prosocial activities in the physical education classroom. Data analysis lead to the conclusion that a more comparative and negatively competitive perception (climates oriented towards how I perform in front of others) decreases engage-

Date of receipt of the original: 2024-05-28.

Date of approval: 2024-08-12.

Please, cite this article as follows: Flores-Piñero, M. del C., González-Hernández, J., & Valdivia-Moral, P. Á. (2024). Teaching action and altruistic behaviour in Physical Education classes. Predictive analysis applying the 3×2 motivational climate model [Acción docente y comportamiento altruista en clases de Educación Física. Un análisis predictivo desde el modelo de clima motivacional 3×2]. *Revista Española de Pedagogía*, 82 (289), 651-666. <https://doi.org/10.22550/2174-0909.4087>

ment in altruistic prosocial behaviour, mainly in boys, promoting instead rivalry and competitive behaviour.

Keywords: prosocial behaviour, motivational climate, prosocial-altruistic behaviour, physical education, teenagers, teachers.

Resumen:

En este estudio, se pretende conocer cómo influye el clima motivacional generado por el profesor de Educación Física (EF) en el desarrollo de la conducta prosocial-altruista. Para ello, los objetivos que se proponen son: (1) conocer qué climas motivacionales construidos por el profesorado en clases de EF facilitan o limitan la aparición de comportamientos prosociales altruistas en su alumnado y (2) describir si existen diferencias de género en el alumnado y si estas se ven influidas de la misma manera por los climas que genera el profesorado. El diseño utilizado ha sido des-

criptivo, no aleatorizado y relacional, en una muestra de 714 adolescentes españoles de ambos sexos, con edades comprendidas entre los 12 y 18 años. Se han aplicado a los alumnos instrumentos para el clima motivacional 3 × 2 y la conducta prosocial en relación con sus experiencias en las clases de educación física. Los resultados señalan que un clima orientado al otro, ya sea por aproximación, ya sea por evitación, disminuye la posibilidad de que aparezcan conductas prosociales altruistas en las clases de educación física. Tras el análisis de los datos, se concluye que una percepción más comparativa y competitiva (climas orientados a cómo me desenvuelvo frente a los demás) disminuye la conducta prosocial altruista, principalmente en chicos, y fomenta conductas de rivalidad y competitividad hacia el otro.

Palabras clave: comportamiento prosocial, clima motivacional, conducta prosocial-altruista, educación física, adolescentes, profesorado.

1. Introduction

Prosocial behaviour was first studied in the 20th century, specifically from the 1970's, and refers to support behaviours that promote social connection and moral development throughout the life course. Such behaviours promote wellbeing, understanding of social norms and cooperative acts and, in turn, favour self-esteem and positive self-concept (Busching & Krahé, 2020; Crone & Achterberg, 2022; Kolgberg, 2014; Li et al., 2021; Preston & Rew, 2022; Son & Padilla-Walker, 2020).

Social Learning Theory (Bandura, 1982) argues that the internalised and motivational control of behaviour lays the foundations for prosocial tendencies (e.g., altruism) instead of comparative tendencies (e.g., being better than others) (Eisenberg & Spinrad, 2014). The former are linked with the formation of strong and effective personalities (Thielmann et al., 2020), whilst the latter are linked with more unstable traits, depending on interpretations of success/failure and their impact on self-concept: e.g., physical or motor

self-concept regarding Physical Education (PE onwards) or social self-concept in sentimental relationships (González-Hernández & Martínez-Martínez, 2020). On the other hand, prosocial tendencies have also been shown to be protective against engagement in disruptive social behaviours such as violence (Ahmed et al., 2020), aggression (Arbel et al., 2022), narcissism (Kauten & Barry, 2016), and alcohol and substance abuse (Hernández-Serrano et al., 2016), whilst also reducing the development of psychopathologies (Memmott-Elison & Toseeb, 2023) throughout childhood and adolescence.

It is important to highlight that prosocial behaviours include altruistic behaviours but that not all prosocial behaviours are altruistic (Lemos & Richaud, 2013). Padilla-Walker and Carlo (2015) classified prosocial behaviour according to different types, with altruistic tendencies standing out as “prosocial acts performed voluntarily, with a sense of justice and without expecting anything in return either in the short or long term” (p. 8). For a prosocial behaviour to be considered to be altruistic and healthy, it must meet the following parameters: a) help somebody else with a *clean* motivation and not from a selfish standpoint; b) support another person’s wellbeing out of empathy; c) be voluntary; d) not expect to receive any immediate extrinsic reward, although an intrinsic reward (driving this behaviour) can be derived, and e) giving more to others than receiving.

Prosocial behaviour can be promoted at any opportunity through school experiences and, specifically, in PE classes (Martí-Vilar

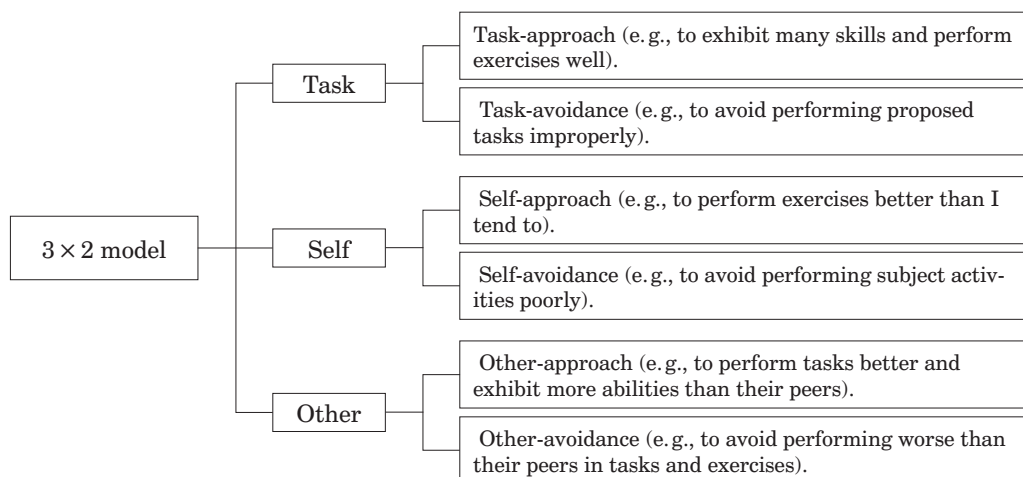
et al., 2019). Acknowledging the educational context as the climate that is promoted in the classroom by teaching staff and perceived by students to facilitate the achievement of both task performance and skill development (Moral-García et al., 2019; Rodrigues et al., 2022; Vasconcellos et al., 2020). Thus, goal achievement assumes a pattern of beliefs pertaining to success, variety of effort and capacity for learning, alongside prosocial feedback between adults and peers (Busching & Krahé, 2020; Cuevas-Campos et al., 2013; Elliot et al., 2013). It mustn’t be forgotten that adolescence represents a stage at which numerous changes occur in development, not only at a physical level but, also, at an emotional and psychosocial level. Essential aspects should be promoted, therefore, which connect interpersonal processes (e.g. empathy and altruism) in the educational setting. These will be reflected in the development of prosocial behaviours, in this way improving wellbeing, social adaptation and co-existence (Bisquerra-Alzina & López-Cassà, 2021)

In recent decades, theoretical evolution of the model adapting motivated behaviour to include educational action (Ames, 1992) has focused on the importance of constructing contexts in which class goal structures influence perceptions of competence and ability beyond individual achievement goals (Bardach et al., 2020). Elliot et al. (2011) argue that, in order to feel competent, goal orientations must have an absolute standard (“task focused”), an interpersonal standard (“self-focused”) and a more normative and interpersonal standard (“focused on the acts of others”), all of which are assessed according to two

valence indicators (approach and avoidance). These goals are illustrated by the 3×2 model of achievement motivation (Figure 1), which outlines student perceptions of their PE teachers according to

perceptions of competence (approach taken to or achievement of desired goals) or incompetence (avoidance or achievement of undesired goals) (Midgley et al., 2000; Murayama et al., 2012).

FIGURE 1. 3×2 theoretical model of achievement goals.



Source: adapted from Elliot et al., 2011.

Finally, the quality of teaching and of the educational system falls on the shoulders of teaching staff. However, sometimes, teachers are not aware of the orientation that they should follow in their training or of the traits that they should possess. Turning attention to PE teaching staff, according to Villaverde-Caramés et al. (2021), the following orientations most stand out: a) to possess pedagogical capacity, subject knowledge, and positive attitude and interest in lifelong training; b) to inspire, feel and transmit values, and to transmit these in class through a pleasant climate; and c) to promote an active and psychosocially healthy lifestyle both inside and outside school.

Following the literature review, a research question is posed around whether

the motivational climate generated by PE teachers impacts student engagement in prosocial-altruistic behaviours. In order to address this question, the main aim of the present work is to identify the impact of the motivational climate generated in mandatory secondary education PE classes on the engagement of students in basic altruistic behaviour as a means of healthy development and psychosocial adaptation. To this end, the following specific objectives were proposed: (1) identify whether the motivational climate constructed by teaching staff in PE classes facilitates or impedes student engagement in altruistic prosocial behaviours and (2) examine the existence of gender differences with regards to the first objective and describe whether the influence of the motivational

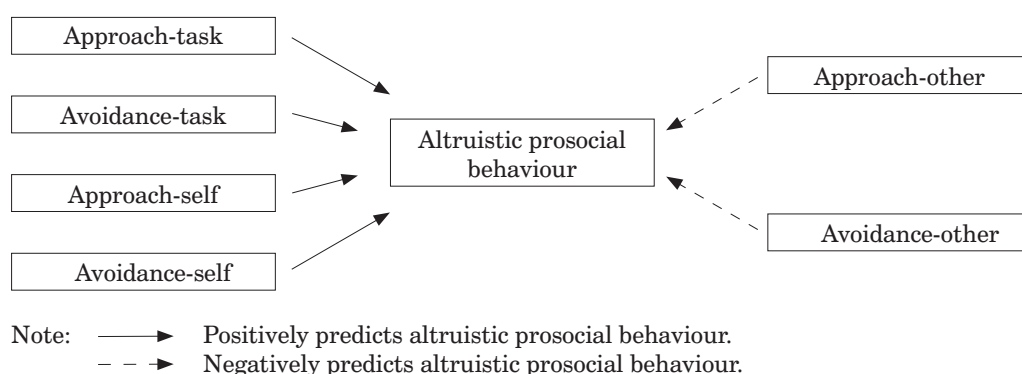
climate generated by teachers differs as a function of gender.

To this end, a hypothetical model (Figure 2) was designed in accordance with the framework laid out by the 3×2 model of goal orientation (Elliot et al., 2011). This model argues that task- and self-oriented motivational climates (both approach and avoidance) promote engagement in altruistic prosocial behaviour in PE classes, whilst other-oriented climates

(whether approach or avoidance) impede and reduce engagement in such behaviours. Thus, the following hypotheses were proposed:

- H1: task- and self-oriented motivational climates will positively predict altruistic prosocial behaviour.
- H2: other oriented motivational climates will negatively predict altruistic prosocial behaviour.

FIGURE 2. Hypothetical model of the motivational climate constructed by PE teachers and student altruistic behaviour.



2. Methodology

2.1. Design and procedure

A descriptive, non-randomised and relational design was employed (Gómez, 2019). The study was cross-sectional in nature. In this sense, data were collected at a single time-point between February and May. A final sample of 714 participants was recruited. Participating schools gave permission for researchers to be present in person to administer questionnaires. Questionnaires took between 15 and 20 minutes to complete and were filled out during class form time.

The present research adhered to the principles laid out by the Declaration of Helsinki (1964) and was approved by the ethics committee at the host university (ref: 2296/CEIH/2021). The research protocol pertained to the following steps. First, the researches got in touch with school directors and PE teachers. Secondly, the research aims and research plan were explained and collaboration was requested (receive agreement to participate and informed consent from tutors). Next, access to classrooms was requested for questionnaire administration whilst,

at the same time, instructions were provided for their completion (via electronic devices administered in quiet spaces, approximately 15-20 minutes in duration). In order to ensure methodological rigour, data collection was preceded by a preliminary question in which consent was requested and the importance of honesty and sincerity when responding was highlighted. Likewise, study participants were informed that they were free to leave the study at any time and that all data would be kept anonymous and confidential throughout the research process in order to guarantee the protection of personal data.

2.2. Participants

The study population pertained to students enrolled in mandatory secondary education public and subsidised (mixed funding) schools in Andalusia and the Canary Islands. In order to identify the population of potential study participants, electronic contact was made with the various boards of education, sport and culture under the auspices of the Junta de Andalucía. The next step was to make contact with individual secondary schools. Schools that agreed to participate in the present study were sent all necessary information, together with the link to access the survey. A final sample of 714 participants was achieved following removal of incorrectly completed questionnaires. In the Canary Islands, participating schools were selected out of convenience, through a contact who put the research team in touch with schools so that they could be sent study documentation and provided with full details regarding the research process.

The study population comprised 714 adolescents aged between 12 and 18 years ($M_{age} = 14.13\%$; $SD_{age} = 1.32$): 388 males ($M_{age} = 14.11\%$; $SD_{age} = 1.30$) and 326 females ($M_{age} = 14.15\%$; $SD_{age} = 1.33$) enrolled at public (81.2 %) or subsidised (mixed funding) (18.8 %) mandatory secondary education institutions located in different regions of Andalusia and the Canary Islands (Spain).

2.3. Instruments

Amongst other general variables of interest, the present study gathered data on the sociodemographic characteristics of age (12-18 years), academic year (1st, 2nd, 3rd and 4th year of compulsory secondary education), type of educational institution (public and subsidised) and sex (males and females).

In order to assess motivational climate in PE classes, the 3 x 2 Motivational Climate Questionnaire conceived by Elliot et al. (2011) was employed. This tool has been validated in the Spanish context by Méndez-Giménez et al. (2018). The questionnaire is composed of 18 items that represent the motivational climate structures generated by PE teachers (ego-oriented, task-oriented, other-oriented) and assess student's perceptions of these climates according to direction or valence (approach, avoidance). Internal consistency of this tool when administered within the examined sample produced values of between .66 (task-avoidance) and .78 (other-approach), whilst the Cronbach alpha produced for the overall scale was .87.

In order to measure prosocial behaviour, the Spanish version of the Prosocial Tendencies Measure Revised (Carlo & Randall, 2002; PTM-R) was employed. This produced a reliability index of 0.79. It is composed of 21 items which are rated along a five-point Likert scale ranging from one (“Does not describe me at all”) to five (“Describes me very well”). This tool measures six types of prosocial tendencies or motivations, however, for the present study, only items pertaining to altruistic prosocial tendencies were considered. An adjusted reliability index of .71 was produced for the overall scale when applied within the present sample.

2.4. Data analysis

In the present study, version 25 of the statistical software package SPSS (IBM) was used to perform all data analysis. First, preliminary analysis was conducted according to measures of central tendency, missing cases were removed, data distribution assessed (Kolmogorov-Smirnov $>.00$) and internal consistency of employed measures examined (Cronbach alpha). Next, analysis of categorical variables was performed in order to identify trends in student responses, followed by differential analysis (t test of mean differences), correlation analysis (Pearson) and simple regression analysis (stepwise method) in order to examine the existing relationship between the dependent variable (prosocial behaviour) and independent variables (motivational climate). For each one of these tests, bootstrapping was also performed (sample <5000) as a means

of improving the reliability of analyses and achieving acceptable confidence levels (CI $>95\%$).

3. Results

3.1. Differential and correlational analysis

T -test analysis of mean differences as a function of gender revealed that females reported significantly higher scores for altruistic prosocial behaviour [$t_{(712,2)} = -4.682, <.00$], avoidance-other motivational climate [$t_{(712,2)} = 3.92, <.00$] and approach-other motivational climate [$t_{(712,2)} = 3.14; <.00$].

With regards to linear correlational analysis (Table 1), and controlling for the aforementioned gender differences, outcomes reflect the existence of significant negative relationships between altruistic prosocial behaviour and motivational climates oriented towards avoidance-other (e.g., avoid exhibiting worse performance than others) and towards approach-other (e.g., wanting to exhibit better performance than others). In other words, student perceptions of competitiveness and rivalry within their motivational climate meant that they tended to engage less in altruistic behaviour.

In addition, it was also observed, although correlation indices were small, that increasing age was associated with decreasing perceptions of an approach-ego orientation ($-.08^*$) and increasing perceptions of an approach-other orientation ($.08^*$). This reveals greater tendencies in these students towards rivalry.

TABLE 1. Correlational analysis adjusted for gender.

	1	2	3	4	5	6	7	8
Age	1	-.033	-.087*	.080*	.026	-.054	-.052	.070
Approach-task		1	.674**	.154**	.246**	.404**	.517**	-.030
Approach-ego			1	.146**	.222**	.458**	.545**	-.041
Approach-other				1	.757**	.278**	.136**	-.182**
Avoidance-other					1	.402**	.334**	-.177**
Avoidance-ego						1	.618**	.026
Avoidance-task							1	.019
Prosocial altruism								1

Note: **significance at the level .01 (two-tailed); *significance at the level .05 (two-tailed). 1 = age; 2 = approach-task; 3 = approach-ego; 4 = approach-other; 5 = avoid-other; 6 = avoid-ego; 7 = avoid-task; 8 = pro-altruist.

3.2. Multiple regression analysis

In order to enable more in-depth analysis of the relationship between variables in a PE context, multiple regression (following a stepwise approach) was performed, which resulted in a final model that explained 27.3% of the variability found in student engagement in prosocial behaviour (DV) according to the motivational climates created by PE teachers (IVs) ($F_{(707,7)} = 26.04$; $R^2 = .273$; $p < .05$) (Table 2).

Controlling for gender, predictive analysis revealed that students who do not perceive an other-oriented motivational climate (which entails students comparing themselves with their peers, promoting competitive behaviours and

rivalry) tend to engage in more altruistic prosocial behaviour. In addition, suitable perceptions of the duties performed by teachers with regards to avoidance-ego also reduce comparisons with others. As a result, students are able to become less self-critical (mainly destructive), exhibit fewer tendencies with regards to inferiority/superiority over others and further support engagement in altruistic behaviour. In the same way, age also emerged as a variable that has an impact on student engagement in altruistic prosocial behaviour in PE classes. As students grow and mature, greater emphasis is placed on forming positive connections with others, reducing competitive outlooks and leaving rivalries with peers to one side.

TABLE 2. Predictive analysis of altruistic prosocial tendencies adjusted for gender.

Model	R	R ²	F	Independent variable	
DV: altruistic prosocial behaviour				Variable	β
1	.182(a)	.033	24.41**	Approach-other	-.182***
2	.201(b)	.040	14.97**	Approach-other	-.189***
				Age	.086*
3	.219 (c)	.048	11.91**	Approach-other	-.215***
				Age	.093*
				Avoidance-ego	.090*
4	.235 (d)	.055	10.36**	Approach-other	-.118*
				Age	.090*
				Avoidance-ego	.119*
				Avoidance-other	-.138*

Note: **significance at the level .01 (two-tailed); *significance at the level .05 (two-tailed).
Excluded variables: approach-task and avoidance-task

4. Discussion

The aim of the present study was to identify the importance of the motivational climate generated by teaching staff in PE classes with regards to student engagement in altruistic prosocial behaviour. In order to develop and plan teaching strategies in PE (and in any other academic subject), it may be useful for teachers to consider the combined fit of strategies in order to deliver experiences based on the three types of climates proposed by the 3 × 2 model (task, ego and other). From a pedagogical standpoint, these have important repercussions on student perceptions.

Present findings confirm H1: task- and other-oriented motivational climates would positively predict altruistic prosocial behaviour. Indeed, significant positive relationships emerged between altruistic prosocial behaviours and motivational climates oriented towards self (e.g., striving to improve) and task (e.g., effort towards learning).

In accordance with that outlined by García-Romero (2015), strong correlations were produced between goal orientations proposed by the 3 × 2 model of motivational climate (self-approach and self-avoidance; task-approach and task-avoidance;

other-approach and other-avoidance), with the strongest relationships pertaining to approach-task and approach-self goals. In the same way, the achievement motivation model conceived by Nicholls (1989), which shares similar foundations and has been adapted to the school context (Ames, 1992), describes that motivational climates oriented towards cooperation and helping others (prosocial tendencies) prevail when task-oriented motivational climates are perceived and are diminished when ego- or competence-oriented climates are perceived. This is supported by research conducted by Bardach et al. (2020) and Martí-Vilar et al. (2019), in which the 2 x 2 model was used.

In the case of H2, motivational climates oriented towards the other negatively predict altruistic prosocial behaviour. Findings indicate that an other-oriented climate, whether characterised by approach or avoidance, decreases engagement in altruistic prosocial behaviour. Findings coincide with those reported by other similar studies performed in different cultural contexts (Baños, 2021). Moreno et al. (2005) conducted a study with adolescents in which participating students were found to perceive a competence-involved climate oriented towards the other and, at the same time, exhibited disruptive behaviour. Moral et al. (2021) discovered that adolescents tended more towards a task-approach-oriented motivational climate, with this being even more the case amongst boys than girls. Nonetheless, outcomes reported by Moral-García et al. (2019) do not coincide with those reported in this study, given that all

students, regardless of gender, agreed that PE teachers instilled a climate oriented towards skill improvement and task performance in class (20.9% of boys and 17.6% of girls).

Further, tendencies towards altruistic behaviours and outcomes pertaining to motivational climate orientations have been related with age. With increasing age, adolescents tend more towards striving for better task performance in comparison with their peers, with positive correlations with age and an other-approach-oriented motivational climate, and a negative correlation with an ego-approach-oriented motivational climate. Jerez and Cabrera-Fernández (2021) conducted a study with university students and reported a positive correlation with a task climate and a negative correlation with an ego climate. In the same way, present findings and those reported by the aforementioned research concur, given that age was also found to be an influencing factor with regards to student engagement in altruistic prosocial behaviour in PE classes. As adolescents grow in age and maturity, greater emphasis is placed on forming positive connections with others, diminishing competitive outlooks and leaving rivalries with others to one side.

The present study employed the 3 x 2 model which is derived from a prior model (Elliot & McGregor, 2001), in which motivational climates are divided into two types, namely, ego and task. In this case, an ego-oriented climate pertains to competitiveness with oneself, as one strives to improve and perform tasks better than

the previous day. In contrast, an other-oriented climate pertains to competition with others. As clearly demonstrated in the present study, students who perceive an approach-other or avoidance-other motivational climate exhibit less altruistic prosocial behaviour. This concurs with findings reported in the two aforementioned research studies.

With regards to gender differences, it is concluded that girls show higher indicators of altruistic tendencies than boys despite them also exhibited higher indicators of other-oriented climates (approach-avoidance). Existing scientific literature highlights that both types of climates promote the behaviours of rivalry and competition between peers, in which adolescents (mainly boys) strive to be better than everybody else and avoid any type of failure during task performance (Johnson & Arduiz, 2021; Ruiz-Juan et al., 2011; Rodrigues et al., 2022). In addition, the data are inspiring to know that, in a large sample, girls compete in comparison with others (without going into whether with other girls or also with boys), arousing interest to further explore the reasons for such results.

These findings do not coincide with those reported by various other studies conducted in recent years, in which males reported engaging in more altruistic prosocial behaviour (Alandette & Hoyos 2009; Pastor et al., 2024).

Whilst González-Hernández and Martínez-Martínez (2020) concluded that girls engaged in more prosocial behaviour than boys (e.g. greater social ability re-

garding helping others). Kamas and Preston (2021) argued that prosocial behaviour may differ in boys and girls as a function of their personality and level of empathy.

Findings of the present study with respect to adolescent prosocial tendencies coincide with the meta-analysis performed by Xiao et al. (2019). This review focused on describing gender differences in different dimensions of prosocial behaviour as measured by the Prosocial Tendencies Measure (PTM) (Carlo & Randall, 2002). This same study also uncovered that girls reported higher scores when it comes to emotional altruistic prosocial behaviour, whilst boys reported higher scores with regards to public prosocial behaviour.

Whilst there is a scarcity of research linking achievement contexts and engagement in altruistic behaviour, it can be deduced that motivational climates constructed by teachers in PE classes either support or impinge engagement in altruistic prosocial behaviour within their students. This is in accordance with the outcomes produced in the present study. Thus, further studies that delve deeper into this line of research are of vital importance in order to guide teaching staff in terms of both awareness raising, performance and the improvement of personal teaching tools, and enriching teaching strategies that encourage prosocial behaviours. This will be crucial to counteract tendencies towards comparisons in some students in PE classes. Such research should entail the design of longitudinal proposals than allow observation of the evolution of altruistic behaviours encouraged by teachers

and peers in PE classrooms, and the inclusion of other study variables that provide more information complement previously reported data. A further possibility is to assess whether the influence of general characteristics (e.g., teacher's gender, type of educational institution, differences according to age and academic year) may vary when subjected to the combined influence of the factors observed and examined in the present work.

This being said, the present work is not exempt of limitations with regards to its initial proposal, structural limitations (e.g., the delay in securing permission and consent from participating school directors and tutors lead to a considerable delay in data collection) and theoretical foundation (e.g., the infancy of research examining altruistic prosocial behaviour in PE classes framed by the 3×2 model of achievement motivation). In addition, the cross-sectional nature of the research methodology urges careful and cautious consideration of the produced outcomes, which only have scientific value in the context and time-frame in which they were collected, making it necessary to replicate these findings. Thus, a proposed future perspective is to continue to work and investigate within the field of prosocial behaviour and its related dimensions and motivational climate in the subject of PE with populations of adolescent students.

5. Conclusions

Following data analysis and addressing the aims of the present research, it is concluded that student perceptions of an other-oriented (approach-avoidance) motiva-

tional climate decreases altruistic prosocial behaviour, mainly in boys, promoting rivalry and competitiveness towards others.

In this sense, reducing comparative and competitive orientations in educational climates requires teachers to play an important role when it comes to supporting social relationships in their students with the dynamics of PE classes (e.g., by reinforcing the acquisition of positive stereotypes and promoting equality between the sexes). Facilitating prosocial feedback during the teaching-learning process leads teaching practice to shine a brighter light on the tasks, responsibilities and speed of progression inherent to the activities performed to achieve educational goals, and social value of the activity. In this way, reinforcing and improving the social-emotional climate in the classroom turns lessons into social experiences that are of great importance and experientiality, promoting values and supporting the development of a positive environment.

Although only few studies have examined the relationships between these variables, it is possible to conclude that the findings produced in the present study are in accordance with those reported by other research that does exist. In addition, the influence of motivational climate and gender was observed, with boys exhibiting a greater tendency towards competitiveness and rivalry (other-oriented climate) and girls exhibiting a greater tendency towards prosocial behaviour.

Throughout conducting the present research, a number of limitations were

detected that should be considered in future research with the aim of improving and continuing to advance by providing meaningful data that is of interest to this field of study. One of the main limitations is the scarcity of scientific literature examining the combination of the variables of interest, making it impossible to compare present outcomes with those reported in other studies. This being said, at the same time, this opens up the future perspective of continuing to examine this line of research. Further, in opting for a cross-sectional approach, it is difficult to determine the temporal (and causal) sequence of events or determine whether a given variable had a direct influence on another. For this reason, it is important to keep in mind that outcomes from cross-sectional designs may be influenced by factors which pertain to both the interpretation of study participants and, also, the interpretation of findings overall (e.g., recall, measurement and selection bias).

To this end, a number of future perspectives are proposed. Firstly, examine larger samples and extend the present research into other educational institutions. Secondly, compare outcomes between the Canary Islands and Andalusia. Thirdly, design and deliver training programs for PE teachers on the influence of the motivational climate they promote in their classes and student psychosocial development.

6. Authors' contributions

María del Carmen Flores-Piñero: Conceptualisation; Data curation; Methodology; Project administration; Resources;

Supervision; Writing (original draft); Writing (review & editing).

Pedro Valdivia-Moral: Methodology; Project administration; Resources; Supervision; Validation; Visualisation; Writing (original draft); Writing (review & editing).

Juan González-Hernández: Data curation; Formal analysis; Methodology; Project administration; Supervision; Validation; Visualisation; Writing (original draft); Writing (review & editing).

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