

Javier García Cazorla

Evaluación de las conductas
docentes del profesorado
aragonés de educación física y su
incidencia sobre la motivación y el
rendimiento profesional

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Tesis Doctoral

**EVALUACIÓN DE LAS CONDUCTAS DOCENTES
DEL PROFESORADO ARAGONÉS DE EDUCACIÓN
FÍSICA Y SU INCIDENCIA SOBRE LA MOTIVACIÓN
Y EL RENDIMIENTO PROFESIONAL**

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**EVALUATION OF TEACHING BEHAVIOURS AMONG
ARAGONESE PHYSICAL EDUCATION TEACHERS AND
THEIR IMPACT ON MOTIVATION AND
PROFESSIONAL PERFORMANCE**

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2024

**Evaluación de las conductas docentes del
profesorado aragonés de Educación
Física y su incidencia sobre la motivación
y el rendimiento profesional**

*Evaluation of teaching behaviours among aragonese
Physical Education teachers and their impact on
motivation and professional performance*

Javier García Cazorla

A mis padres, Rosa y José Luis,

Gracias.

Agradecimientos

Agradecimientos

Un 20 de septiembre de 2018, un chico aficionado al fútbol entró en el pabellón Río Isuela de Huesca para asistir a su primera clase de Acción Docente, sin saber que esa asignatura y esos profesores cambiarían el rumbo de su vida. Aquella clase fue especial por varios motivos: 1) la sesión fue impartida por **Ángel Abós**, compañero de equipo de fútbol sala y paisano, una coincidencia hermosa que más adelante sería determinante en mi decisión final; 2) desmontaron por completo mi concepción inicial de la Educación Física y el deporte. Poco a poco, **Luis García** transformó mi percepción durante los debates posteriores a las clases. No se lo pusimos fácil, ya que nuestros “conocimientos” y experiencias previas, nuestras “mochilas de vivencias” (como diría Ángel), eran totalmente opuestas a lo que nos querían enseñar en esta asignatura. Pero lo consiguieron, vaya si lo consiguieron. Gracias a Luis, esa nueva visión me hizo enamorarme de la importancia de la comunicación y de la forma en la que interactuamos con las personas. Recuerdo que un día, al volver solo a casa después de una clase, pensaba: “Ojalá algún día pueda tener esa capacidad de expresar lo que pienso y de debatir como lo hace Luis”. Al terminar el Grado de CCAFD, tenía claro que quería hacer un doctorado. A pesar de enamorarme del ámbito docente en tercero de carrera, tuve otras tentativas antes de finalizar el Grado que me dejaron algo dubitativo. Sin embargo, una conversación con Ángel en las piscinas de Gelsa, durante mi jornada laboral como socorrista, disipó todas mis dudas. A partir de ese día, supe que quería realizar un doctorado en Educación, y no solo eso, sino que deseaba formar parte del equipo de Luis y Ángel. Menos mal que tomé esa decisión, porque de lo contrario creo que me hubiese arrepentido toda la vida. Las dos personas que más influencia han tenido en mi formación; por ello, solo puedo decirlos GRACIAS.

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Tablas y Figuras

Relación de Tablas y Figuras de la Tesis Doctoral

A continuación, se listan las Tablas y Figuras utilizadas en la Tesis Doctoral. Con el fin de optimizar la claridad y la comprensión de los resultados en cada uno de los estudios, se ha decidido reiniciar la numeración de las Tablas y las Figuras en cada uno de los apartados de la Tesis Doctoral, así como en cada uno de los cuatro estudios. Esta estrategia facilita una lectura más fluida y un seguimiento más ordenado de los datos presentados en el contexto de cada estudio individual.

Relación de las Tablas

Metodología general

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Consideraciones Preliminares

Consideraciones Preliminares

De acuerdo con las directrices de la Real Academia Española (RAE) y el consenso entre numerosos lingüistas, se ha procurado, siempre que ha sido posible, utilizar un lenguaje inclusivo a lo largo de este texto, optando por términos neutros que incluyan a todas las personas, sin intención de generar menosprecio o exclusión por razón de género. Además, dado el ámbito académico al que pertenece esta Tesis Doctoral, todo el documento ha sido redactado y estructurado siguiendo las directrices de la Asociación Psicológica Americana (APA, 7ª edición). Finalmente, en cumplimiento de las normativas de la Escuela de Doctorado de la Universidad de Zaragoza para obtener la mención internacional, algunos apartados del documento (e.g., resumen, objetivos, estudios y conclusiones) se han redactado en inglés.

Contexto del Investigador durante la Tesis Doctoral

Esta Tesis Doctoral ha sido realizada bajo la dirección y supervisión del Dr. Luis García González y el Dr. Ángel Abós Catalán, en colaboración con el Grupo de Investigación de referencia “Educación Física y Promoción de la Actividad Física” (EFYPAF) (S17_23R; Resolución BOA 20/03/23). Además, está alineada con el proyecto de investigación “PID2021-127897NA-I00”, financiado por el Ministerio de Ciencia, Innovación y Universidades “MICIU/AEI/10.13039/501100011033/FEDER, UE”.

El doctorando, Javier García Cazorla, ha sido beneficiario de un contrato predoctoral de 48 meses financiado por el Gobierno de Aragón (ORDEN CUS/803/2021, del 8 de julio), de los cuales ha completado 36 meses. Los 12 restantes, en caso de obtener el título de doctor, se llevarán a cabo en una modalidad postdoctoral, permitiendo continuar con la investigación en esta línea de estudio. Siguiendo las normativas de la Escuela de Doctorado de la Universidad de Zaragoza, uno de los requisitos para obtener la mención internacional es realizar una estancia de al menos 90 días en una universidad internacional. Por ello, el doctorando, en la fecha de la defensa, habrá realizado dos estancias, de 90 y 91 días respectivamente, en la Universidad de Gante (Gante, Bélgica) y en la Pontificia Universidad Católica de Perú (Lima, Perú). La primera estancia, del 22 de marzo al 22 de junio de 2023, bajo la supervisión de Leen Haerens y Katrien de Cocker, financiada por una beca Iberus. La segunda estancia, del 2

de septiembre al 2 de diciembre de 2024, bajo la supervisión de Lennia Matos, fue financiada por una beca de movilidad del Gobierno de Aragón.

Abreviaturas

A continuación, se presentarán todas las abreviaturas utilizadas a lo largo del documento para facilitar su comprensión y lectura.

Abreviatura	Significado
AIC	Akaike Information Criterion
AF	Actividad Física
BCH	Bolck-Croon-Hagenaars
BIC	Bayesian Information Criterion
BLR	Bootstrap Likelihood Ratio
BPN	Basic Psychological Needs
CFA	Confirmatory Factor Analysis
CFI	Comparative Fit Index
DF	Degrees of Freedom
DT	Desviación Típica
EF	Educación Física
EFYPAF	Educación Física y Promoción de la Actividad Física
LPA	Latent Profile Analysis
M	Media/Mean
MANOVA	Multivariate Analyses of Variance
MANCOVA	Multivariate Analyses of Covariance
MLR	Robust maximum Likelihood
NPB	Necesidades Psicológicas Básicas
PA	Physical Activity
PE	Physical Education
RMSEA	Root Mean Square Error of Approximation
SD	Standard Deviation
SDT	Self-Determination Theory
SEM	Structural Equation Modeling
SPSS	Statistical Package for Social Sciences
SRMR	Standardised Root Mean Square

SSA-BIC	Sample-Size Adjusted Bayesian Information Criterion
TAD	Teoría de la Autodeterminación
TLI	Tucker-Lewis Index

Resumen/Abstract

Resumen

Recientemente, la figura del docente de Educación Física (EF) se ha consolidado como un pilar esencial, no solo en la promoción de un proceso motivacional de calidad y en la generación de consecuencias positivas en el alumnado, sino también en su propio desarrollo motivacional, así como en aspectos relacionados con su bienestar psicológico y desempeño profesional. Sin embargo, estudios recientes han señalado que los docentes, y especialmente los de EF, constituyen uno de los colectivos más afectados a nivel psicológico, físico y social, lo que repercute negativamente tanto en su desempeño laboral como en consecuencias educativas de los estudiantes. Ante esta problemática, y dada la relevancia del docente de EF a través de su intervención en las clases, se hace evidente la necesidad de llevar a cabo una investigación que aborde esta cuestión. Así, un estudio que explore, desde una perspectiva teórica hasta su aplicación práctica, cómo el proceso motivacional de los docentes de EF influye directamente en su metodología de enseñanza y como estos comportamientos impactan en diversos resultados laborales, adquiere un alto interés científico. Además, la mejora en el proceso motivacional y en el estilo de enseñanza del profesorado puede influir indirectamente en el proceso motivacional y en resultados educativos de los estudiantes, promoviendo un entorno educativo más saludable y productivo.

Con el objetivo de abordar esta cuestión, la presente Tesis Doctoral se sustenta en un marco teórico ampliamente consolidado en el contexto educativo, la Teoría de la Autodeterminación (TAD), y en un modelo emergente de gran relevancia para comprender el estilo motivacional docente, el modelo circular. Este modelo, establece la existencia de cuatro estilos motivacionales docentes (i.e., apoyo a la autonomía, estructura, control y caos), los cuales se diferencian en función del grado de apoyo o amenaza a las necesidades psicológicas básicas (NPB) de sus estudiantes (i.e., eje horizontal), así como en el grado de directividad ejercido por los docentes (i.e., eje vertical). Como resultado de la intersección de estos dos ejes, el estilo de apoyo a la autonomía se caracteriza por un alto apoyo a las NPB y una baja directividad, mientras que el estilo estructurado también ofrece un alto apoyo a las NPB, pero con una alta directividad. Ambos estilos se consideran motivadores. Por otro lado, esta intersección también da lugar a los estilos controlador y caótico, los cuales se consideran desmotivadores. Estos estilos desmotivadores se caracterizan por un bajo apoyo a las NPB, siendo el estilo controlador altamente directivo, mientras que el caótico presenta

bajos niveles de directividad. Además, cada uno de estos estilos se subdivide en dos enfoques más específicos, conformando un total de ocho enfoques de enseñanza motivacionales (i.e., participativo, adaptativo, orientador, clarificador, demandante, dominador, de abandono y a la espera) que los docentes pueden emplear para interactuar con su alumnado y dirigir sus clases. Este modelo permite un análisis más preciso y detallado de la influencia de estos estilos y enfoques motivacionales en el desarrollo de resultados (des)adaptativos en el contexto del profesorado y el alumnado de EF. Finalmente, comprender con precisión el modelo circular y sus fundamentos, puede facilitar el diseño de programas formativos para docentes de EF que se ajusten mejor a sus necesidades reales, asegurando así una mayor efectividad. Por lo tanto, esta Tesis Doctoral se desarrolló con un objetivo principal, claro y concreto. Siguiendo los principios de la TAD y, más concretamente, del modelo circular, el propósito fue analizar, desde la perspectiva del profesorado de EF, qué variables influyen en su estilo motivacional docente, y cómo este genera, en última instancia, diversas consecuencias tanto para el propio docente como para su alumnado. Para alcanzar este objetivo general, se establecieron varios objetivos específicos, examinados a través de cuatro estudios independientes pero interrelacionados.

Para la recolección de datos, se realizaron varias mediciones, una para cada estudio. En los estudios 1 y 2, participaron 1307 docentes de EF ($M_{edad} = 36.60$; $DT = 8.68$; 58.35% hombres) de Educación Primaria (55.24%) y de Educación Secundaria (44.76%) de diferentes centros educativos de la Comunidad Autónoma de Aragón, con diferentes años de experiencia docente ($M_{experiencia} = 10.69$; $DT = 8.39$). En el Estudio 4, de carácter experimental, se llevaron a cabo tres recogidas de datos (i.e., pre-test, intermedia y post-test). En ellas, participaron 17 docentes de EF (ocho en el grupo experimental y nueve en el grupo control) y sus estudiantes (813 en total) de varios centros educativos de Educación Secundaria de Aragón. Los ocho docentes del grupo experimental ($M_{edad} = 31$; $DT = 7.15$; 100% hombres) tenían diferentes años de experiencia docente ($M_{experiencia} = 6$; $DT = 6.53$) y enseñaban a 336 estudiantes ($M_{edad} = 14.48$; $DT = 1.29$; 46.7% chicos). Los nueve docentes del grupo control ($M_{edad} = 31.22$; $DT = 3.46$; 77.8% hombres) también tenían varios años de experiencia docente ($M_{experiencia} = 3.78$; $DT = 2.17$) y enseñaban a 477 estudiantes ($M_{edad} = 14.91$; $DT = 1.20$; 47.6% chicas). Las variables evaluadas para los docentes incluyeron la satisfacción y frustración de las NPB en su trabajo, la motivación hacia la enseñanza, el estilo motivacional docente, la satisfacción laboral, el rendimiento profesional y el

agotamiento emocional. En los estudiantes, las variables fueron su percepción del estilo motivacional utilizado por sus docentes de EF, la satisfacción y frustración de sus NPB en EF, la motivación hacia la EF, las experiencias en EF, el aprendizaje percibido en EF y la intención de hacer actividad física (AF). Además, ambos reportaron información sociodemográfica relevante, como el género, la etapa educativa y la edad (para ambos grupos), la experiencia docente (docentes) y el curso académico (estudiantes).

El primer estudio tuvo un doble objetivo. En primer lugar, analizar en qué medida los estilos y enfoques motivacionales del profesorado de EF varían en función del género, la etapa educativa y los años de experiencia docente. Los resultados mostraron que los docentes varones, de secundaria y con más experiencia, obtuvieron puntuaciones más bajas en los dos enfoques de apoyo a la autonomía (i.e., participativo y adaptativo) y más altas en los enfoques controladores (i.e., demandante y dominador) y caóticos (i.e., de abandono y a la espera). En segundo lugar, este estudio pretendía examinar en qué medida la satisfacción y frustración de las NPB de los docentes predecía su estilo motivacional, mediado por la motivación hacia la enseñanza. Los resultados indicaron que, tras controlar el género, la etapa educativa y la experiencia docente, la satisfacción de las NPB predijo positivamente los enfoques participativos, adaptativos, orientadores y clarificadores, a través de la motivación autónoma. La frustración de las NPB predijo positivamente los enfoques demandantes, dominadores, de abandono y a la espera, a través de la motivación controlada y la desmotivación. Estos hallazgos subrayan la relevancia de los rasgos personales del profesorado de EF y la importancia de la calidad de su proceso motivacional en la adopción de distintos estilos motivacionales.

El segundo estudio también tuvo un doble objetivo. Por un lado, identificar en qué medida los docentes de EF combinan los enfoques de apoyo a la autonomía (i.e., participativo y adaptativo), estructura (i.e., orientador y clarificador), y control (i.e., demandante y dominador) en su práctica docente. Los resultados identificaron cuatro perfiles docentes: 1) “alta autonomía-alta estructura-bajo control”, 2) “alta autonomía-alta estructura-alto control”, 3) “moderada autonomía-moderada estructura-bajo control”, y 4) “baja autonomía-moderada estructura-moderado control”. Por otro lado, este estudio examinó las diferencias en la motivación hacia la enseñanza, la satisfacción laboral y el rendimiento profesional entre los perfiles previamente identificados. Los docentes de EF que proporcionaban predominantemente alto apoyo a la autonomía y alta estructura (i.e., perfil 1: “alta autonomía-alta estructura-bajo control”), en general,

reportaron una mayor calidad en la motivación hacia la enseñanza, así como niveles más elevados de satisfacción laboral y rendimiento profesional. En contraste, aquellos docentes de EF que impartían una enseñanza fundamentalmente estructurada y controladora (i.e., perfil 4: “baja autonomía-moderada estructura-moderado control”) reportaron los peores resultados motivacionales y laborales. Entre los perfiles 2 (i.e., “alta autonomía-alta estructura-alto control”) y 3 (i.e., “moderada autonomía-moderada estructura-bajo control”), las diferencias fueron menos evidentes, salvo en el caso de la motivación controlada, que fue mayor en el perfil 2, caracterizado por altos niveles de control. Así, parece importante para el profesorado de EF obtener una motivación de alta calidad hacia la enseñanza, ya que esto facilitará que la adopción de un perfil instruccional caracterizado por combinar estilos motivadores predominantemente y, en última instancia, promoverá un mejor funcionamiento psicológico y desempeño laboral. Estos hallazgos también apuntan hacia los riesgos de proporcionar control, especialmente en su formato predominante (i.e., perfil 4: “baja autonomía-moderada estructura-moderado control”), pero también, aunque en menor medida, cuando se combina con los estilos motivadores (i.e., perfil 2: “alta autonomía-alta estructura-alto control”).

En el tercer estudio, el objetivo fue describir de manera detallada el protocolo de un programa formativo para el profesorado de EF, denominado “MotivaDosEF”. Basándose en los marcos teóricos de la TAD y el modelo circular, este programa pretendía detallar las estrategias motivacionales y los pasos a seguir para optimizar el estilo motivacional del profesorado de EF. Es decir, se pretendía que los docentes de EF aprendieran a apoyar la autonomía y proporcionar estructura, así como a ser menos controladores y caóticos con sus estudiantes. Se diseñó un ensayo controlado aleatorizado con un enfoque de métodos mixtos, asignando a los docentes aleatoriamente al grupo experimental o control. El programa formativo “MotivaDosEF” incluyó cuatro sesiones presenciales en grupo y dos sesiones de seguimiento (una individual y otra en grupo). De este modo, durante aproximadamente cinco meses, los docentes debían poner en práctica las estrategias aprendidas en sus clases de EF. Para evaluar la efectividad del programa, se realizaron mediciones sobre los estilos motivacionales, variables motivacionales y resultados (des)adaptativos tanto en los docentes de EF como en sus estudiantes en tres momentos distintos: antes del programa de formación (T1), durante la intervención (T2) y al final de la intervención (T3). Asimismo, para evaluar la fidelidad de la intervención, se empleó una medida

observacional mediante la grabación de dos clases a los docentes del grupo experimental, coincidiendo en el tiempo con los momentos T2 y T3. Este protocolo detallado, proporciona una guía valiosa que puede ser replicada en otros contextos educativos y niveles de enseñanza, contribuyendo así a la mejora de la formación del profesorado en activo.

En el cuarto estudio, el objetivo principal fue examinar los efectos del programa formativo “MotivaDosEF” sobre el estilo motivacional de los docentes de EF, tanto desde su propia perspectiva como desde la de sus estudiantes. Además, se evaluó el impacto del programa en el proceso motivacional tanto del alumnado como del profesorado, y diferentes consecuencias relacionadas con la EF (estudiantes) y el desempeño psicológico y laboral (profesorado). Los resultados indicaron que los estudiantes del grupo experimental percibieron un incremento en el uso de los enfoques de apoyo a la autonomía (i.e., participativo y adaptativo) y estructura (i.e., orientador y clarificador) por parte de sus docentes. Además, experimentaron una mayor satisfacción de sus NPB, experiencias más positivas y un mayor aprendizaje en EF, así como mayor intención de hacer AF. Al mismo tiempo, los estudiantes del grupo experimental reportaron una disminución en la percepción de los enfoques controladores (i.e., demandante y dominador) utilizados por sus docentes y de la frustración de sus NPB. Paralelamente, los docentes de EF del grupo experimental reportaron un aumento en la satisfacción de sus NPB y en su rendimiento profesional, junto con un mayor uso del enfoque participativo. Asimismo, indicaron una menor frustración de autonomía, así como una reducción en los niveles de los enfoques demandante, dominador y a la espera. Estos resultados subrayan la importancia de diseñar e implementar programas de formación continua basados en la TAD y el modelo circular para mejorar la calidad educativa en el contexto de la EF. Los hallazgos destacan que este tipo de programas son fundamentales para dotar a los docentes de EF de las competencias y herramientas necesarias para crear un entorno motivador y de apoyo en el aula, lo que a su vez se traduce en una mejora general del proceso educativo.

En conclusión, los cuatro estudios que componen esta Tesis Doctoral subrayan la importancia de que el profesorado de EF desarrolle un proceso motivacional de alta calidad, caracterizado por la satisfacción de sus NPB en su trabajo y una motivación autónoma hacia la enseñanza. Esto les conducirá a implementar y combinar estilos de enseñanza predominantemente motivadores, caracterizados por un alto apoyo a la autonomía y a la estructura. Como resultado, se beneficiarán de un ambiente de trabajo

más adaptativo, lo que tendrá efectos positivos tanto en su funcionamiento psicológico como en la motivación y aprendizaje de los estudiantes. Además, los hallazgos enfatizan la necesidad de diseñar programas formativos continua que no solo potencien estos estilos motivadores, sino que también reduzcan los enfoques desmotivadores, como el control y el caos. Por lo tanto, la administración educativa debería asumir la responsabilidad de diseñar, organizar, ofrecer y dinamizar oportunidades de formación en estrategias motivacionales para el profesorado. Asimismo, estas formaciones deben estar adaptadas a sus necesidades y características para asegurar una mayor efectividad en la calidad del sistema educativo.

Abstract

Recently, the role of the Physical Education (PE) teacher has been established as a key element not only in promoting a high-quality motivational process and generating positive outcomes in students but also in their own motivational development, as well as in certain outcomes related to their psychological well-being and professional performance. However, recent studies have highlighted that teachers, especially PE teachers, constitute one of the most affected groups on psychological, physical, and social levels, which negatively impacts both their job performance and students' educational outcomes. In light of this issue and given the relevance of PE teachers through their interventions in the classroom, the need for a research project addressing this matter becomes evident. Thus, a study that explores, from a theoretical perspective through to practical application, how the motivational process of PE teachers directly influences their teaching methodology and how these behaviours impact various professional outcomes is of significant scientific interest. Furthermore, improvements in teachers' motivational processes and teaching styles may indirectly affect students' motivational processes and educational outcomes, promoting a healthier and more productive educational environment.

To address this issue, the present Doctoral Thesis is grounded in a well-established theoretical framework within the educational context, Self-Determination Theory (SDT), and an emerging model of great relevance for understanding teachers' (de)motivating styles, the circumplex model. This model established the existence of four (de)motivating teaching styles (i.e., autonomy support, structure, control, and chaos), which differ based on the degree of support or threat to students' basic psychological needs (BPN), as well as the level of directiveness exercised by teachers. As a result of the intersection of these two axes, the autonomy-supportive style is characterised by BPN support and low directiveness, while the structuring style also offers BPN support but with high directiveness. Both styles are considered motivating. On the other hand, this intersection also leads to controlling and chaotic styles, which are considered demotivating. These demotivating styles are characterised by BPN thwart, with the controlling style being highly directive and the chaotic style having low levels of directiveness. Additionally, each of these styles is further divided into two more specific approaches, forming a total of eight (de)motivating approaches (i.e., participative, attuning, guiding, clarifying, demanding, domineering, abandoning, and

awaiting) that teachers can employ to interact with their students and direct their classes. This model allows for a more precise and detailed analysis of the influence of these (de)motivating styles and approaches on the development of (mal)adaptive outcomes in the context of PE teachers and students. Finally, a precise understanding of the circumplex model and its foundations can facilitate the design of training programs for PE teachers that better address their real needs, thus ensuring greater effectiveness. Therefore, this Doctoral Thesis was developed with one clear and specific main objective. Following the principles of SDT and, more specifically, the circumplex model, the aim was to analyse, from the perspective of PE teachers, which variables influence their (de)motivating teaching style, and how this, ultimately, generates various consequences for both the teachers themselves and their students. To achieve this general objective, several specific objectives were established, which were examined through four independent but interrelated studies.

To carry out these studies, several data collections were conducted, one for each study. In studies 1 and 2, 1307 PE teachers participated ($M_{age} = 36.60$; $SD = 8.68$; 41.65% female) from both Primary (55.24%) and Secondary Education (44.76%) in various educational institutions in the Autonomous Community of Aragón, with varying years of teaching experience ($M_{experience} = 10.69$; $SD = 8.39$). In study 4, due to its experimental nature, three data collections were conducted (i.e., pre, intermediate, and post). A total of 17 PE teachers (eight in the experimental group and nine in the control group) and their students (813 in total) from different Secondary Education schools in Aragón participated. The eight teachers in the experimental group ($M_{age} = 31$; $SD = 7.15$; 100% male) had varying years of teaching experience ($M_{experience} = 6$; $SD = 6.53$) and taught 336 students ($M_{age} = 14.48$; $SD = 1.29$; 46.7% male). The nine teachers in the control group ($M_{age} = 31.22$; $SD = 3.46$; 77.8% male) also had several years of teaching experience ($M_{experience} = 3.78$; $SD = 2.17$) and taught 477 students ($M_{age} = 14.91$; $SD = 1.20$; 52.4% female). The variables assessed for teachers included their BPN satisfaction at work, the quality of their motivation for teaching, their (de)motivating teaching style, job satisfaction, professional performance, and emotional exhaustion. For the students, the variables assessed were their perception of their PE teachers' (de)motivating teaching style, their BPN satisfaction and frustration in PE, their motivation towards PE, their experiences in PE, perceived learning in PE, and their intention to engage in physical activity (PA). Additionally, both groups reported relevant demographic

information, such as gender, school level, and age (for both groups), teaching experience (teachers), and academic year (students).

The first study had a dual objective. First, to analyse to what extent PE teachers' (de)motivating styles and approaches vary based on gender, school level, and years of teaching experience. The results showed that male teachers, those in secondary education, and those with more experience had lower scores on the two autonomy-supportive approaches (i.e., participative and attuning) and higher scores on the controlling approaches (i.e., demanding and domineering) and chaotic approaches (i.e., abandoning and awaiting). Second, this study aimed to examine to what extent teachers' BPN satisfaction and frustration predict their (de)motivating teaching style, via their motivation towards teaching. The results indicated that, after controlling for gender, school level, and teaching experience, BPN satisfaction positively predicted the participative, attuning, guiding, and clarifying approaches via autonomous motivation. BPN frustration positively predicted the demanding, domineering, abandoning, and awaiting approaches via controlled motivation and amotivation. These findings underscore the relevance of PE teachers' personal traits and the quality of their motivational process in adopting different teaching styles.

The second study also had a dual objective. First, to identify to what extent PE teachers combine autonomy-supportive approaches (i.e., participative and attuning), structuring approaches (i.e., guiding and clarifying), and controlling approaches (i.e., demanding and domineering) in their teaching practice. The results identified four teaching profiles: 1) "high structure-high autonomy support-low control" 2) "high structure-high autonomy support-high control" 3) "moderate structure-moderate autonomy support-low control" and 4) "moderate structure-low autonomy support-moderate control". Second, this study examined the differences in motivation towards teaching, job satisfaction, and professional performance across the identified profiles. PE teachers who predominantly provided high structure and high autonomy support (i.e., profile 1: "high structure-high autonomy support-low control") generally reported higher quality of motivation, as well as higher levels of job satisfaction and professional performance. In contrast, those PE teachers who employed a predominantly structured and controlling teaching (i.e., profile 4: "moderate structure-low autonomy support-moderate control") reported lower levels of these outcomes. Between profiles 2 (i.e., "high structure-high autonomy support-high control") and 3 (i.e., "moderate structure-moderate autonomy support-low control") the difference were less clear, except for

controlled motivation, which was higher in profile 2, characterised by high levels of control. Thus, it seems important for PE teachers to achieve high-quality motivation towards teaching, as this would facilitate the adoption of a predominantly motivating instructional profile, ultimately promoting better psychological functioning and job performance. These findings also highlight the risks of applying control, especially in its predominant form (i.e., profile 4: “low autonomy support-moderate structure-moderate control”), but also, to a lesser extent, when combined with motivating styles (i.e., profile 2: “high autonomy support-high structure-high control”).

In the third study, the aim was to provide a detailed description of the protocol for a training programme for PE teachers, called “MotivaDosEF”. Based on the theoretical frameworks of SDT and the circumplex model, this programme aimed to outline motivational strategies and steps to optimise the (de)motivating style of PE teachers. Specifically, the goal was for PE teachers to learn how to support autonomy and provide structure, while also reducing controlling and chaotic behaviours towards their students. A randomised controlled trial with a mixed-methods approach was designed, with teachers randomly assigned to either the experimental or control group. The “MotivaDosEF” training programme included four face-to-face group sessions and two follow-up sessions (one individual and one group). Over approximately five months, the teachers were expected to apply the strategies they had learned in their PE classes. To assess the programme’s effectiveness, measurements were taken regarding (de)motivating teaching styles, motivational variables, and (mal)adaptive outcomes for both PE teachers and their students at three distinct points in time: before the training programme (T1), during the intervention (T2), and after the intervention (T3). Additionally, to evaluate the fidelity of the intervention, an observational measure was used by recording two lessons taught by the experimental group teachers, coinciding with T2 and T3. This detailed protocol provides a valuable guide that can be replicated in other educational contexts and levels, contributing to the improvement of in-service teacher training.

In the fourth study, the aim was to examine the effects of the “MotivaDosEF” training programme on the (de)motivating teaching style of PE teachers, both from their own perspective and from that of their students. Additionally, the study evaluated the programme’s impact on the motivational process of both students and teachers, as well as various outcomes related to PE (students) and psychological and professional performance (teachers). The results indicated that students in the experimental group

perceived an increase in the use of autonomy-supportive approaches (i.e., participative and attuning) and structure (i.e., guiding and clarifying) by their teachers. They also experienced greater BPN satisfaction, more positive experiences, and enhanced perceived learning in PE, along with a greater PA intention. At the same time, students in the experimental group reported a decrease in the use of controlling approaches (i.e., demanding and domineering) by their PE teachers, and in their BPN frustration. Similarly, PE teachers in the experimental group reported an increase in their BPN satisfaction and professional performance, along with a greater use of participative approach. They also indicated a reduction in autonomy frustration and a decrease in the levels of demanding, domineering, and awaiting approaches. These results underscore the importance of designing and implementing continuous training programmes based on SDT and the circumplex model to enhance the quality of education in PE contexts. The findings highlight that such programmes are crucial in equipping PE teachers with the necessary skills and tools to create a motivating and supportive classroom environment, ultimately leading to an overall improvement in the educational process.

In conclusion, the four studies that comprise this Doctoral Thesis highlight the importance of PE teachers developing a high-quality motivational process, characterised by their BPN satisfaction at work and an autonomous motivation towards teaching. This will lead them to implement and combine predominantly motivating teaching styles, characterised by high autonomy support and structure. As a result, they will benefit from a more adaptive working environment, which will have positive effects on their psychological well-being as well as on students' motivation and learning. Additionally, the findings emphasise the need for continuous training programmes that not only promote these motivating styles but also reduce the use of demotivating approaches, such as control and chaos. Therefore, educational authorities should take responsibility for designing, organising, providing, and promoting training opportunities in motivational strategies for teachers. Moreover, these training sessions must be tailored to teachers' specific needs and characteristics to ensure greater effectiveness in improving the quality of the educational system.

1. Introducción

1. Introducción

En los últimos años, la relevancia de la figura del docente ha despertado un creciente interés, no solo en términos de su papel orientador y guía para los estudiantes (Patañ et al., 2023), sino también por su influencia en la generación de experiencias positivas y/o negativas durante las clases (Slingerland & Borghouts, 2011). Asimismo, se ha investigado el impacto que los comportamientos docentes tienen en el proceso motivacional de los estudiantes (Diloy-Peña et al., 2024; Vasconcellos et al., 2020), y en la creación de hábitos de práctica de Actividad Física (AF) en el alumnado (Koka et al., 2020). Estudios recientes también han demostrado que las acciones y decisiones que los docentes toman en el aula están significativamente condicionadas por su propio proceso motivacional y bienestar psicológico (Abós, Haerens, et al., 2018). Sin embargo, diversos autores han subrayado que el estado motivacional y el desempeño de los docentes es cada vez más preocupante (Skaalvik & Skaalvik, 2015). Este deterioro puede conllevar a un mayor uso de estilos de enseñanza desmotivadores (Abós, Haerens, et al., 2018; Aelterman et al., 2019; Burgueño, Abós, et al., 2024), lo cual a su vez podría disminuir la calidad de la motivación del alumnado y afectar negativamente su rendimiento académico (Diloy-Peña et al., 2024; Klusmann et al., 2016).

La Teoría de la Autodeterminación (TAD; Ryan & Deci, 2017), ofrece un marco teórico sólido para estudiar el estilo motivacional docente, definido como “el conjunto de sentimientos y comportamientos interpersonales en los que se basan los docentes para motivar a los estudiantes a participar en las actividades de aprendizaje y beneficiarse de ellas” (Reeve et al., 2014). Numerosos estudios han puesto de manifiesto los efectos positivos que tiene el uso de estilos motivadores por parte de los docentes de EF en el proceso motivacional del alumnado (Vasconcellos et al., 2020; White et al., 2021). Por el contrario, también se han documentado los efectos negativos asociados al uso de estilos desmotivadores (Vasconcellos et al., 2020; White et al., 2021). A pesar de las evidencias que señalan que el proceso motivacional de los docentes -de EF y de otras áreas- influye directamente en el estilo motivacional que emplean en sus clases (Abós, Haerens, et al., 2018; Cheon et al., 2020), existe una falta de investigación centrada específicamente en el profesorado de EF. Además, se ha demostrado que el proceso motivacional de los docentes influye indirectamente en el proceso motivacional del alumnado, con el estilo motivacional del docente actuando como mediador (Pelletier & Rocchi, 2016). Por ello, esto no solo afecta la gestión del

aula y las experiencias del alumnado, sino que también impacta directamente en los propios docentes y en sus resultados laborales. Del mismo modo, aunque varios estudios han identificado diferencias en la motivación hacia la enseñanza y en el estilo motivacional empleado por los docentes de EF en función de sus características sociodemográficas y personales (Escriva-Boulley et al., 2018; Hellebaut et al., 2023), especialmente en términos de género, etapa educativa y experiencia docente (Hellebaut et al., 2023; Vermote et al., 2023), aún no existen resultados concluyentes sobre cómo estas variables influyen en la adopción de un estilo motivacional específico. En este contexto, Aelterman et al. (2019) propusieron un modelo circular basado en la TAD para conceptualizar de manera más integral los estilos motivacionales. Este modelo introduce los estilos de apoyo a la autonomía (i.e., enfoques participativos y adaptativos), estructura (i.e., enfoques orientadores y clarificadores), control (i.e., enfoques demandantes y dominadores) y caos (i.e., enfoques de abandono y a la espera), organizados en dos ejes según su nivel de apoyo o amenaza a las necesidades psicológicas básicas (NPB) de los estudiantes y el grado de directividad del docente.

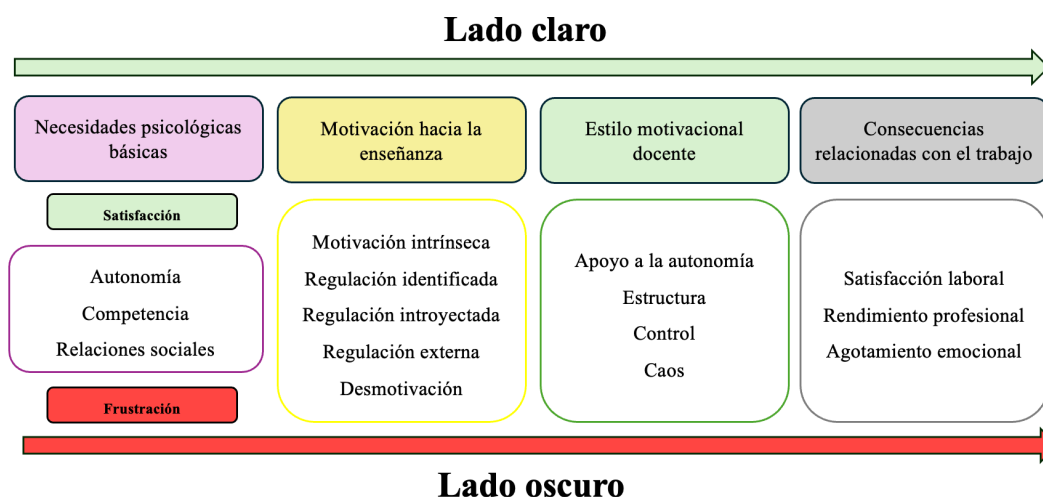
Dada la realidad descrita, resulta necesario continuar profundizando en este proceso, identificando posibles soluciones a esta problemática generalizada. Para ello, se propone un marco de referencia basado en la TAD (Ryan & Deci, 2017) y en el modelo circular (Aelterman et al., 2019), con el objetivo de comprender con mayor precisión el estilo motivacional del profesorado de EF. En primer lugar, parece fundamental examinar cómo el proceso motivacional de los docentes influye en su forma de interactuar y comportarse en el aula, considerando las posibles diferencias derivadas de sus características personales y sociodemográficas. En segundo lugar, puede ser relevante explorar hasta qué punto los docentes de EF combinan diferentes enfoques y estilos de enseñanza en relación con el apoyo o la amenaza a las NPB y su nivel de directividad, así como las diferencias entre perfiles en cuanto a su motivación hacia la enseñanza y diversos resultados relacionados con su trabajo, como la satisfacción laboral y el rendimiento profesional. Este conocimiento permitirá diseñar e implementar programas de formación efectivos y eficientes, orientados a optimizar el estilo motivacional del profesorado de EF, lo que, en consecuencia, generará resultados positivos tanto para los estudiantes como para los propios docentes.

1.1. El Proceso Motivacional del Docente de EF Bajo la Óptica de la TAD

La TAD (Ryan & Deci, 2017) postula que existen tres NPB: autonomía, competencia y relación social. Estas NPB son fundamentales para el crecimiento, la adaptación y el bienestar psicológico de las personas, incluidos los docentes de EF. Según la TAD, las percepciones individuales sobre la satisfacción de estas necesidades pueden variar en función de la interpretación de los factores contextuales, motivacionales y sociales presentes en el entorno laboral (Bartholomew et al., 2014; Pelletier et al., 2002). Actualmente, como se ilustra en la Figura 1, la TAD establece una distinción entre el “lado claro”, asociado con la satisfacción de estas NPB, y el “lado oscuro”, relacionado con su frustración (Vansteenkiste et al., 2020).

Figura 1.

Descripción del proceso motivacional del profesorado basado en la TAD.



Nota. Fuente, elaboración propia.

La satisfacción de la autonomía se refiere a la percepción de los docentes de EF de poder tomar decisiones y sentir voluntariedad en su labor (e.g., seleccionar libremente las unidades didácticas de la programación), mientras que la frustración de la autonomía está vinculada a una sensación de obligación y presión en las tareas diarias (e.g., verse forzados a emplear una metodología específica para cumplir con los estándares del centro). La satisfacción de la competencia se manifiesta cuando los docentes perciben éxito y efectividad en sus tareas (e.g., observar el progreso de los estudiantes a través del feedback proporcionado), mientras que la frustración de la competencia surge cuando experimentan sentimientos de ineficacia o fracaso en su

desempeño (e.g., percibir que los estudiantes no están aprendiendo ni mostrando interés). Por su parte, la satisfacción de las relaciones sociales se refleja en la percepción de los docentes de estar conectados e integrados con sus compañeros y estudiantes (e.g., sentir que pueden compartir problemas con sus compañeros de departamento), mientras que la frustración de las relaciones sociales ocurre cuando los docentes se sienten excluidos o rechazados en su entorno laboral (e.g., sentir que no son bien recibidos por otros docentes y/o que no logran conectar con sus estudiantes) (Vansteenkiste et al., 2020).

La TAD sostiene que la satisfacción y la frustración de las NPB pueden coexistir en el contexto de la EF, y que ambas influyen en la adopción de diferentes tipos de calidad motivacional (Abós et al., 2019; Abós, Haerens, et al., 2018; Bartholomew et al., 2014). Estos tipos de motivación se sitúan a lo largo de un continuo de autodeterminación (Ryan y Deci, 2020). En el extremo más autodeterminado del continuo se encuentra la motivación autónoma, que caracteriza a los docentes de EF que disfrutan de la enseñanza y no les importa dedicar tiempo y esfuerzo a preparar sus clases (i.e., motivación intrínseca), o que consideran su profesión como valiosa y significativa para ellos mismos y la sociedad (i.e., regulación identificada). En el centro del continuo, con niveles más bajos de autodeterminación, se sitúa la motivación controlada, que describe a aquellos docentes que enseñan impulsados por presiones internas, como evitar la culpa o mantener la autoestima (i.e., regulación introyectada), o por presiones o razones externas, como cumplir con las exigencias del equipo directivo, evitar sanciones o percibir un salario (i.e., regulación externa). Finalmente, en el extremo opuesto del continuo, se encuentra la desmotivación, caracterizada por la percepción de los docentes de que su labor carece de sentido, lo que deriva en falta de esfuerzo y compromiso (Abós, Haerens, et al., 2018).

La evidencia empírica ha demostrado que aquellos docentes cuya satisfacción de las NPB es alta tienden a mostrar mayores niveles de motivación autónoma (Abós et al., 2019; Abós, Haerens, et al., 2018), mientras que aquellos cuya frustración de las NPB es predominante presentan mayores niveles de motivación controlada y desmotivación (Collie et al., 2016; Van de Berghe et al., 2014).

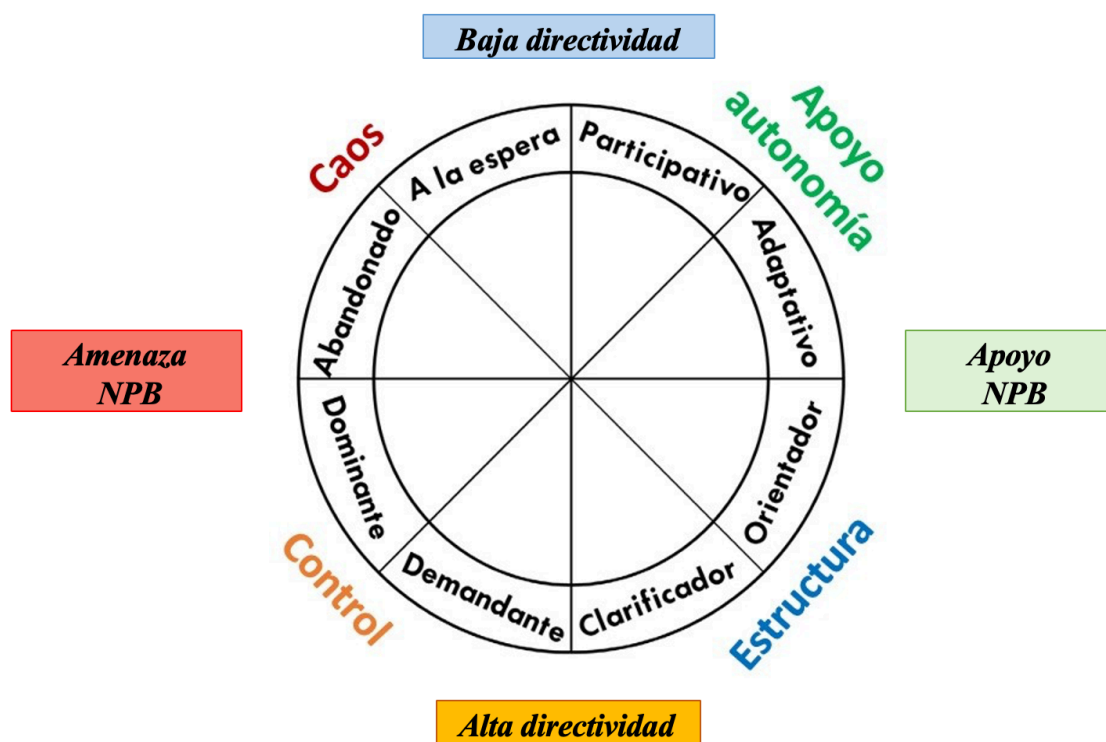
1.2. El Estilo Motivacional Docente desde el Modelo Circular

Estudios previos basados en la TAD han demostrado la relación existente entre la satisfacción y frustración de las NPB de los docentes y su motivación hacia la

enseñanza con el estilo motivacional de enseñanza que estos emplean durante sus clases (Abós, Haerens, et al., 2018; Vermote et al., 2020, 2023). Con el fin de obtener una visión comprensiva y profunda de los diferentes estilos motivacionales que los docentes pueden utilizar, Aelterman et al. (2019) propusieron un modelo de estructura circular (ver Figura 2). Este modelo circular identifica cuatro estilos motivacionales docentes (i.e., apoyo a la autonomía, estructura, control y caos), los cuales se organizan en función del grado en el que apoyan o amenazan las NPB de los estudiantes (eje x) y del nivel de directividad con el que los docentes interactúan con sus estudiantes (eje y). En la Figura 2 se observa que cada uno de estos estilos motivacionales se subdivide en dos enfoques específicos, conformando así un total de ocho enfoques que los docentes de EF pueden emplear durante sus clases.

Figura 2.

Representación gráfica de los estilos y enfoques motivacionales docentes en el modelo circular.



Nota. Fuente, traducido de Aelterman et al. (2019) y extraído de García-González et al. (2021).

Por un lado, el primer estilo motivador es el apoyo a la autonomía (i.e., apoyo a las NPB y baja directividad). Los docentes que proporcionan un entorno flexible, receptivo a los intereses y preferencias de sus estudiantes, están implementando este estilo de enseñanza (Vansteenkiste et al., 2019). Este estilo puede expresarse a través de

del enfoque participativo (i.e., los docentes de EF permiten que sus estudiantes tomen decisiones y tengan un rol activo en las sesiones y tareas) y el enfoque adaptativo (i.e., los docentes atienden las demandas y preocupaciones de los estudiantes, fomentan sus intereses y proporcionan explicaciones justificadas) (Burgueño, Abós, et al., 2024). El segundo estilo motivador es el estilo estructurado (i.e., apoyo a las NPB y alta directividad). Los docentes que centran sus esfuerzos en guiar a los estudiantes fomentando su progreso y adaptándose a sus capacidades proporcionan este estilo docente (Vansteenkiste et al., 2019). Este estilo se implementa mediante un enfoque orientador (i.e., los docentes ajustan el nivel de las tareas a las capacidades de los estudiantes y proporcionan feedback útil y orientado a los objetivos) y un enfoque clarificador (i.e., los docentes comunican de manera clara y detallada los objetivos de las sesiones y las expectativas, supervisando el progreso de los estudiantes) (Escriva-Boulley et al., 2021).

Por otro lado, el primer estilo desmotivador es el estilo controlador (i.e., amenaza a las NPB y alta directividad). Los docentes que emplean un tono interpersonal de presión y manipulación para que sus estudiantes se comporten, piensen o sientan de una manera determinada están utilizando un estilo controlador (Vansteenkiste et al., 2019). Este estilo desmotivador puede implementarse mediante un enfoque demandante (i.e., los docentes de EF emplean órdenes estrictas, un lenguaje coercitivo, recompensas condicionadas y amenazas de sanciones) o un enfoque dominador (i.e., los docentes emplean estrategias de manipulación emocional, como la inducción a la culpa y la vergüenza pública) (Burgueño, Abós, et al., 2024). El segundo estilo desmotivador es el estilo caótico (i.e., amenaza a las NPB y baja directividad). Los docentes que adoptan un comportamiento de dejar hacer (i.e., laissez-faire), caracterizado por comportamiento inconsistentes y desorganizados, están empleando un estilo caótico (Aelterman et al., 2019). Este estilo se puede observar a través de un enfoque de abandono (i.e., los docentes dejan de prestar atención a los estudiantes que no consiguen completar las tareas después de varios intentos fallidos) y un enfoque a la espera (i.e., los docentes que no planifican de manera estructurada sus sesiones, sino que dejan que el desarrollo de la clase ocurra de forma espontánea) (Escriva-Boulley et al., 2021).

Finalmente, la evidencia científica ha resaltado la importancia de un proceso motivacional de calidad (i.e., satisfacción de las NPB → motivación autónoma) y la adopción por parte de los docentes de unos estilos y enfoques de enseñanza motivadores (i.e., apoyo a la autonomía y estructura) para generar consecuencias positivas

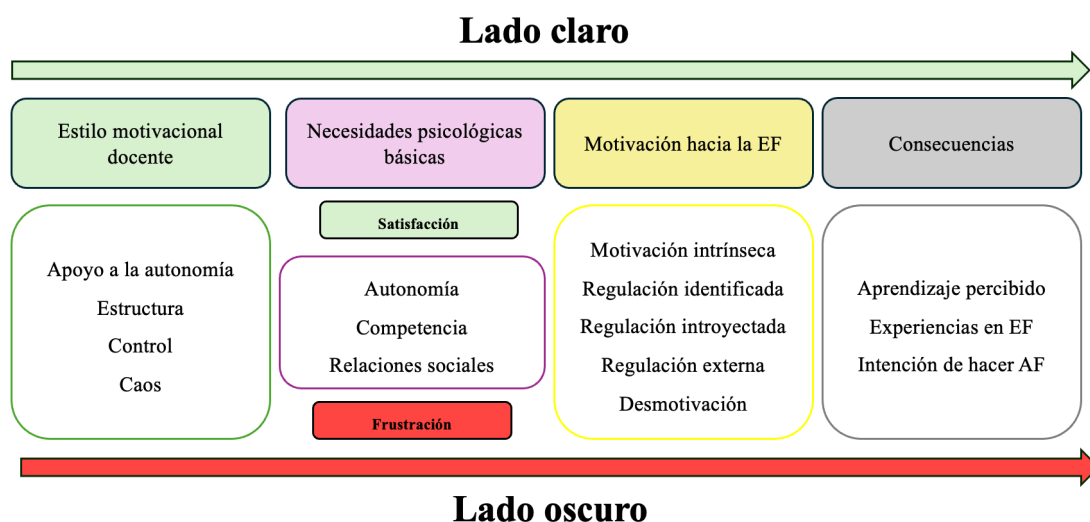
relacionadas con el desempeño laboral. En este sentido, estudios previos han demostrado que los docentes que experimentan una mayor satisfacción de sus NPB y emplean estilos motivadores tienden a presentar mayores niveles de bienestar, satisfacción laboral, compromiso y rendimiento profesional (Cheon et al., 2020; Slemp et al., 2020). Por el contrario, aquellos cuya frustración de las NPB es elevada y emplean estilos desmotivadores, suelen presentar mayores niveles de estrés y burnout, así como una menor satisfacción laboral y rendimiento profesional (Cheon et al., 2020; Slemp et al., 2020).

1.4. La Influencia del Estilo Motivacional Docente en el Proceso Motivacional del Alumnado

Al igual que el proceso motivacional de los docentes influye en su estilo motivacional durante las clases de EF (Abós, Haerens, et al., 2018; Vermote et al., 2020, 2023), se ha evidenciado que el estilo motivacional docente percibido por los estudiantes tiene un impacto directo en su propio desarrollo motivacional (ver Figura 3) (Burgueño et al., 2024).

Figura 3.

Descripción del proceso motivacional del alumnado basado en la TAD.



Nota. Fuente, elaboración propia.

En esta línea, investigaciones previas basadas en la TAD y el modelo circular han mostrado que los estudiantes que perciben que sus docentes de EF utilizan estilos de apoyo a la autonomía (i.e., enfoque participativo y adaptativo) y estructura (i.e.,

enfoque orientador y clarificador) tienden a tener satisfechas sus NPB (Burgueño, Abós, et al., 2024). Además, se ha identificado como algunos enfoques, por ejemplo, el clarificador, pueden incluso contribuir a la prevención de la frustración de las NPB (Burgueño, Abós, et al., 2024). En contraste, los estudiantes que perciben que sus docentes emplean estilos de control (i.e., enfoque demandante y dominador) y caos (i.e., enfoque de abandono y a la espera) suelen experimentar frustración de sus NPB (Burgueño, Abós, et al., 2024). Asimismo, ambos estilos obstaculizan la satisfacción de las NPB del alumnado (Burgueño, Abós, et al., 2024), socavando su proceso motivacional.

De manera análoga a lo que ocurre con los docentes, la satisfacción de las NPB en los estudiantes se asocia positivamente con niveles más altos de motivación autónoma hacia las clases de EF, mientras que la frustración de las necesidades se relaciona con una mayor motivación controlada y desmotivación hacia la EF (Vasconcellos et al., 2020). Finalmente, los estudiantes que perciben que sus docentes utilizan estilos de apoyo a la autonomía (i.e., enfoque participativo y adaptativo) y estructura (i.e., enfoque orientador y clarificador) tienen mejores experiencias en EF y mayor aprendizaje durante las clases, así como una intención mayor de hacer AF fuera del contexto escolar (Diloy-Peña et al., 2024; Vasconcellos et al., 2020). Por el contrario, aquellos estudiantes que perciban a sus docentes como controladores (i.e., enfoque demandante y dominador) y/o caóticos (i.e., enfoque abandonado y a la espera) reportan peores resultados emocionales y comportamentales (Leo et al., 2022), así como experiencias menos satisfactorias, menor aprendizaje percibido en EF y una intención más baja de hacer AF en su tiempo libre (Diloy-Peña et al., 2024).

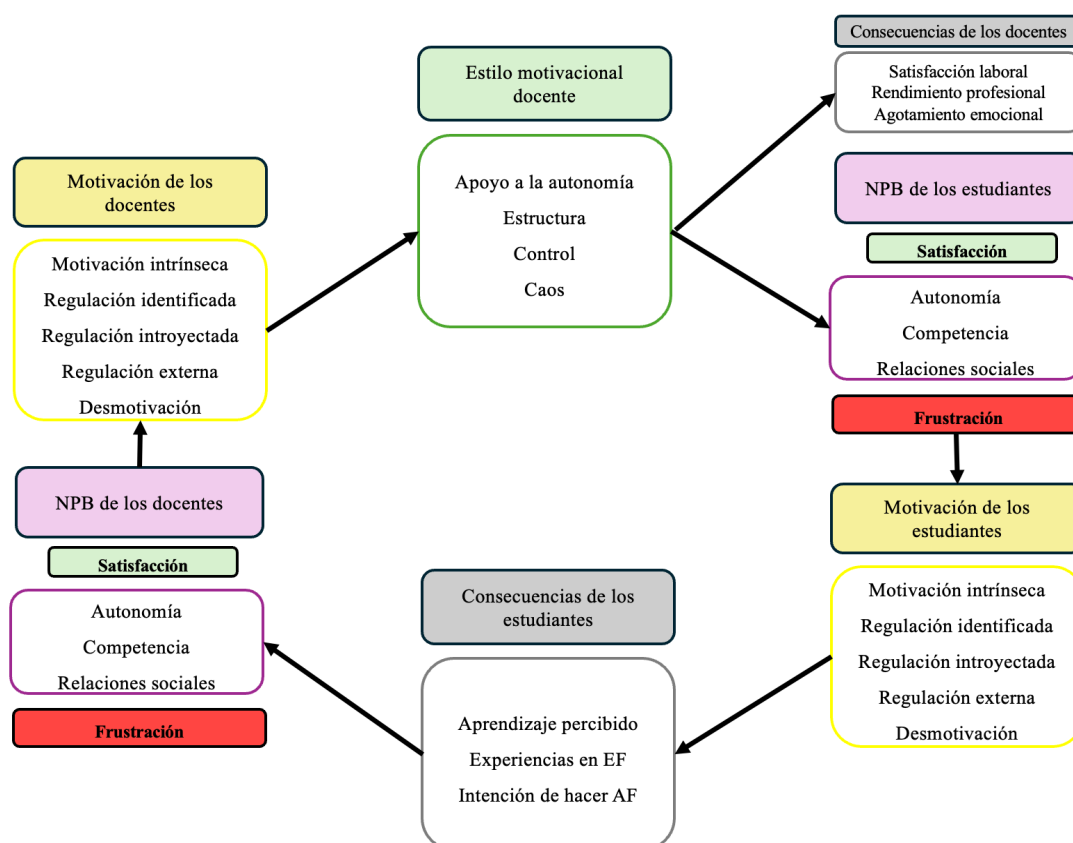
Por tanto, resulta crucial que los docentes adopten estilos motivadores en su enseñanza para promover un proceso motivacional de alta calidad en sus estudiantes, caracterizado por la satisfacción de las NPB y la motivación autónoma, lo cual se traduce en consecuencias positivas dentro y fuera del contexto de EF. De igual modo, es esencial que los docentes minimicen el uso de estilos desmotivadores, con el fin de evitar un proceso motivacional de baja calidad en sus estudiantes, marcado por la frustración de las NPB, la motivación controlada y/o la desmotivación, lo cual genera consecuencias negativas (Ryan & Deci, 2020; Vasconcellos et al., 2020; White et al., 2021).

1.5. Secuencia completa de la TAD: Reciprocidad Profesorado-Alumnado.

Los argumentos previamente expuestos resaltan la importancia del estilo motivacional de los docentes, no solo por su impacto en el desarrollo y aprendizaje de los estudiantes, sino también por su influencia directa en la práctica docente y en el ambiente educativo general, tal como se ilustra en la Figura 4.

Figura 4.

Secuencia completa de la TAD.



Nota. Fuente, elaboración propia.

Por ejemplo, bajo el sustento de la TAD (Ryan & Deci, 2017) un docente de EF que permita a sus estudiantes tomar decisiones en las actividades en función de sus intereses y motivaciones (i.e., apoyo a la autonomía) y les proporcione retroalimentación constructiva orientada a objetivos de manera clara y definida (i.e., estructura) generará una mayor satisfacción de las NPB en sus estudiantes. Esto, a su vez, favorecerá el desarrollo de una motivación autónoma hacia la EF, haciendo que disfruten de las clases en sí mismas, lo que se reflejará en un aprendizaje más elevado, mejores experiencias en clase e incluso un mayor compromiso con la práctica de AF en su tiempo libre. Este

docente, al observar que sus estudiantes disfrutan y adquieren conocimientos durante las clases, también experimentará una mayor satisfacción de sus propias NPB (e.g., se sentirá más competente), lo que potenciará su calidad motivacional, propiciando el uso de estilos de enseñanza motivadores. Finalmente, esto contribuirá a un aumento de su satisfacción laboral y de su rendimiento profesional.

Por el contrario, un docente que constantemente amenace a sus estudiantes (i.e., control) y/o no se preocupe por su progreso (i.e., caos) provocará frustración en las NPB de su alumnado, lo que conllevará una motivación de menor calidad o incluso desmotivación. Esto resultará en una menor percepción de aprendizaje, peores experiencias en clase y una disminución de la adherencia a la AF fuera del aula. A su vez, estos docentes, al observar que sus estudiantes no están motivados y no progresan, experimentarán frustración de sus propias NPB (e.g., se sentirán menos competentes), lo que se traducirá en una motivación de peor calidad o incluso en desmotivación. Como consecuencia, tenderán a emplear estilos de enseñanza desmotivadores dado que pensarán que no es importante poner esfuerzos en su trabajo. Finalmente, esto afectará negativamente tanto su satisfacción laboral como su rendimiento profesional.

1.6. La importancia de la creación de programas formativos para docentes de EF

Dada la relevancia del estilo motivacional docente en el contexto educativo, resulta fundamental diseñar e implementar programas de intervención basados en la TAD y el modelo circular que optimicen su uso. Hasta la fecha, los programas formativos previos sustentados por la TAD han concentrado sus esfuerzos predominantemente en la implementación de estrategias orientadas al apoyo de la autonomía (e.g., Schneider et al., 2020; Tilga et al., 2021), obteniendo resultados positivos, aunque limitados en cuanto a su alcance. No obstante, algunos estudios han ampliado su enfoque para incorporar elementos de otros estilos motivacionales docentes, apoyando la autonomía a través de la estructura (Cheon et al., 2020) o apoyando la autonomía y reduciendo comportamientos controladores (Reeve & Cheon, 2024). A pesar de que estos programas han demostrado ser eficaces para mejorar los estilos motivacionales docentes y algunos resultados relacionados con el trabajo (e.g., eficacia docente, satisfacción laboral, pasión hacia la enseñanza) (e.g., Cheon et al., 2020), la mayoría se han centrado exclusivamente en las percepciones del alumnado, sin explorar en profundidad el impacto directo sobre los docentes.

En los últimos años, investigaciones recientes han comenzado a expandir esta perspectiva. En particular, tres estudios desarrollados en el ámbito educativo han explorado el impacto de las intervenciones formativas basadas en el modelo circular sobre los estilos motivacionales de los docentes, desde la perspectiva de los docentes (Cheon et al., 2020; Conesa et al., 2023; Jang et al., 2023). Sin embargo, ninguno de estos trabajos ha examinado de manera exhaustiva los ocho enfoques propuestos por el modelo circular. Dado que los docentes suelen combinar en sus clases estrategias que, de manera simultánea, apoyan o amenazan las NPB de los estudiantes (Burgueño, García-González, et al., 2024; García-González et al., 2023), es imprescindible que los programas formativos no se limiten únicamente a promover conductas motivadoras, sino que también se enfoquen en reducir aquellas que resultan perjudiciales para el proceso educativo. Además, es importante tener en cuenta que cada docente de EF posee un perfil pedagógico único (Burgueño, García-González, et al., 2024), lo que implica que las intervenciones formativas deben estar ajustadas a las particularidades y necesidades individuales de cada docente.

En esta línea, un programa formativo reciente (Reeve & Cheon, 2024) resalta la importancia de emplear una variedad de metodologías para maximizar la efectividad de los programas. Estas metodologías incluyen ejemplos prácticos (Assor et al., 2018), videos ilustrativos (Escriva-Boulley et al., 2018), sesiones de práctica (Zhang et al., 2021), y tutorías individualizadas (Levin, 2024), entre otros enfoques. Asimismo, adoptar un enfoque congruente con los principios de la TAD, en el que los formadores utilicen estilos motivadores y eviten aquellos desmotivadores en el desarrollo del programa formativo, ha mostrado tener un impacto positivo en la formación de los docentes (Aelterman et al., 2013). Además, el uso de herramientas de observación (Van Doren et al., 2023) se presenta como una estrategia clave para obtener información precisa sobre los diferentes perfiles docentes. Estas herramientas permiten proporcionar retroalimentación personalizada basada en el análisis de video, lo que facilita a los docentes mejorar sus estilos docentes de manera más efectiva.

Por consiguiente, la presente Tesis Doctoral propone, en primer lugar, examinar desde la perspectiva de los docentes los factores que influyen en su estilo motivacional, debido a la escasa evidencia existente en este ámbito. Se analizarán las relaciones y predicciones entre estas variables utilizando como base la TAD y el modelo circular. En segundo lugar, se investigarán las posibles combinaciones de los estilos motivacionales docentes y sus consecuencias, con el objetivo de, finalmente, desarrollar un programa

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de formación docente fundamentado en la evidencia empírica obtenida y en la literatura existente. Finalmente, se evaluarán los efectos de este programa tanto en los docentes como en sus estudiantes, contribuyendo de este modo al avance del conocimiento en este campo.

2. Objetivos / Aims

2. Objetivos

Basándose en la sólida evidencia científica previamente aportada por la TAD (Ryan & Deci, 2017) y el modelo circular (Aelterman et al., 2019; Burgueño, Abós, et al., 2024; Escrivá-Boulley et al., 2021), el objetivo general de la presente Tesis Doctoral es *“Examinar y mejorar el estilo motivacional docente del profesorado de EF mediante una comprensión detallada de sus antecedentes, consecuencias y posibles combinaciones, con el fin de entender el efecto de la mejora sobre su propio proceso motivacional y el del alumnado”*. Para alcanzar este objetivo general, se han definido varios objetivos específicos, que se estructuran en los cuatro estudios que componen la Tesis Doctoral.

- **Estudio 1**

- Objetivo 1: Analizar en qué medida los enfoques motivacionales de los docentes de EF difieren en función del género, la etapa educativa y los años de experiencia docente.
- Objetivo 2: Evaluar en qué medida las NPB de los docentes predicen su estilo motivacional docente, mediado por la motivación hacia la enseñanza.

- **Estudio 2**

- Objetivo 3: Identificar las posibles combinaciones de apoyo a la autonomía, estructura y control utilizados por los docentes de EF durante sus clases.
- Objetivo 4: Examinar las diferencias en la motivación hacia la enseñanza, la satisfacción laboral y el rendimiento profesional entre los perfiles identificados.

- **Estudio 3**

- Objetivo 5: Describir de manera detallada y estructurada el programa formativo “MotivaDosEF”, basado en la TAD y el modelo circular, destinado a optimizar el estilo motivacional docente del profesorado de EF.

- **Estudio 4**

- Objetivo 6: Examinar, desde la perspectiva del profesorado y de sus estudiantes, los efectos del programa formativo “MotivaDosEF” sobre el estilo motivacional docente, el proceso motivacional de ambos grupos, y diferentes resultados relacionados con la EF para los estudiantes y con el funcionamiento laboral y psicológico para el profesorado.

2. Aims

Based on the solid scientific evidence provided by SDT (Ryan & Deci, 2017) and the circumplex model (Aelterman et al., 2019; Burgueño, Abós, et al., 2024; Escriva-Boulley et al., 2021), the general aim of this Doctoral Thesis is *“to examine and improve the (de)motivating teaching style of PE teachers through a detailed understanding of its antecedents, consequences, and possible combinations, in order to understand the impact of these improvements on both their own motivational process and that of their students”*. To achieve this general aim, different specific objectives have been established, which structure the four studies that comprise this Doctoral Thesis.

- **Study 1**

- Aim 1: To analyse the extent to which PE teachers’ (de)motivating teaching approaches differ across gender, school level, and years of teaching experience.
- Objective 2: To test paths from PE teachers’ need-based experiences to their (de)motivating teaching approaches, via motivation quality.

- **Study 2**

- Aim 3: To identify combinations of self-perceived autonomy-supportive, structuring, and controlling approaches used by PE teachers in their lessons.
- Aim 4: To examine differences in motivation for teaching, job satisfaction, and professional performance across the previously identified profiles.

- **Study 3**

- Aim 5: To provide a detailed and structured description of the “MotivaDosEF” training programme, based on SDT and the circumplex model, aimed at optimising the (de)motivating teaching style of PE teachers.

- **Study 4**

- Aim 6: To examine, from the perspective of both teachers and students the effects of the “MotivaDosEF” training programme on teachers’ (de)motivating teaching style, the motivational process for both students and teachers, and various outcomes PE related outcomes for students and work-related outcomes for teachers.

3. Metodología General

3. Metodología General

La presente Tesis Doctoral ha sido desarrollada conforme a la normativa vigente de la Universidad de Zaragoza. A continuación, se expone la metodología general utilizada en la Tesis Doctoral, así como en los estudios correspondientes. En el apartado 4, “Estudios”, se encuentra una descripción detallada del método específico empleado en cada uno de ellos, con un resumen conciso pero preciso de los respectivos diseños.

3.1. Aspectos Éticos

En términos generales, el desarrollo de esta Tesis Doctoral y de los cuatro estudios que la conforman se ha ajustado a las directrices establecidas en la Declaración de Helsinki, con especial énfasis en el tratamiento ético de los participantes humanos, el consentimiento informado y la confidencialidad de los datos obtenidos. Esta Tesis Doctoral está vinculada al proyecto de Investigación “Evaluación y optimización de las conductas docentes en Educación Física para mejorar los procesos motivacionales y niveles de Actividad Física del alumnado” de la Agencia Estatal de Investigación, que ha sido aprobado por el Comité de Ética de la Universidad de Extremadura (código: 153/2022), en la sesión celebrada el 28 de septiembre de 2022 (ver Anexo 1).

En los estudios que involucraron solamente a docentes de EF (i.e., estudios 1 y 2), cada participante fue previamente informado sobre los objetivos y requisitos del proyecto en el que se les invitaba a participar (Anexo 2). Aquellos que aceptaron formar parte del estudio firmaron un consentimiento informado (Anexo 3). En el Estudio 3, al tratarse de un protocolo descriptivo de un programa formativo que no involucraba la participación directa de seres humanos, no requirió la firma de consentimientos informados. Sin embargo, el protocolo fue registrado en ClinicalTrials.gov (Identificador: NTC06479369 / ID protocolo: PID2021-127897NA-I00), donde se detallan los procedimientos éticos que deben seguirse en el futuro. En el Estudio 4, cuyo propósito era evaluar los efectos del programa formativo en docentes de EF y sus estudiantes, y considerando que el investigador principal debía acceder a los centros educativos colaboradores para la recolección de datos cuantitativos y la grabación de sesiones, se llevaron a cabo varios procedimientos éticos adicionales. Se proporcionaron documentos informativos tanto para los docentes del grupo experimental (Anexo 5) como para los del grupo control (Anexo 6), así como un consentimiento informado para los docentes participantes (Anexo 7). Además, se entregó un documento informativo

para los centros educativos, junto con el consentimiento informado correspondiente (Anexo 8), así como un documento informativo y un consentimiento informado para las familias de los estudiantes (Anexo 9 y Anexo 10).

3.2. Diseño del Proyecto

En los dos primeros estudios, que abordan los cuatro primeros objetivos específicos, se empleó un diseño *ex post facto*, descriptivo y correlacional, utilizando un enfoque transversal y como método de recogida de datos se utilizaron los cuestionarios autorreportados (Fontes de Gracia et al., 2010). En el Estudio 3, correspondiente al quinto objetivo, se describieron exclusivamente las características del programa formativo “MotivaDosEF”. Finalmente, en el Estudio 4, que abordó el sexto objetivo de la Tesis Doctoral, se implementó un diseño de ensayo controlado aleatorizado con un enfoque de métodos mixtos (White, 2013), utilizando tanto cuestionarios como observaciones para la recogida de datos.

3.3. Procedimiento General

Para los dos primeros estudios de esta Tesis Doctoral, se llevó a cabo una estrategia de reclutamiento de docentes de EF mediante la difusión de mensajes breves en varios foros y redes sociales especializadas en EF (e.g., grupos de WhatsApp, Facebook y Twitter). Estos mensajes incluían un enlace que proporcionaba acceso a un documento informativo sobre la investigación y sus objetivos (Anexo 2), así como al consentimiento informado (Anexo 3). Tras aceptar participar y firmar el consentimiento, los docentes completaban un cuestionario en línea, cuya duración aproximada era de 25 minutos, garantizando la confidencialidad y anonimato de las respuestas. El cuestionario estuvo disponible durante 30 días, con el fin de maximizar la participación. La plataforma utilizada evitaba la omisión de respuestas, ya que requería que los participantes respondieran a todas las preguntas antes de avanzar. Una vez finalizado el plazo de participación, solo el investigador principal tuvo acceso a las respuestas, garantizando así la confidencialidad de los datos.

En el Estudio 3, al no implicar la participación de sujetos humanos, el procedimiento consistió en la revisión bibliográfica exhaustiva y en el desarrollo detallado del programa formativo, a través del trabajo coordinado entre los investigadores implicados.

Por último, en el Estudio 4, se emplearon diversas plataformas de redes sociales (e.g., Instagram, Twitter, WhatsApp, entre otras) y correo electrónico para reclutar docentes de EF. Se difundió un póster informativo que detallaba la población diana, los contenidos del programa, los objetivos y las fechas previstas para su desarrollo (Anexo 4). Este póster también incluía dos códigos QR: uno con un documento de información adicional (Anexo 5 y Anexo 6) y otro para la inscripción a través de un breve cuestionario en *Google Forms* (Anexo 7). En el documento de información adicional se ofrecía una explicación detallada de los objetivos, fases del programa, criterios de inclusión, requisitos de participación y habilidades docentes a desarrollar durante la formación. Las dudas fueron resueltas por el equipo investigador vía correo electrónico o telefónicamente. El periodo de inscripción duró aproximadamente 21 días. Una vez confirmada la participación de los docentes, se envió un documento informativo y el consentimiento informado a los centros educativos (Anexo 8), proporcionando una descripción clara de los objetivos del programa. Posteriormente, se distribuyeron documentos informativos y consentimientos para las familias de los estudiantes (Anexos 9 y 10), a quienes los docentes inscritos enseñaban. Una vez firmados todos los consentimientos, tanto los docentes como los estudiantes completaron un cuestionario en tres momentos diferentes (i.e., pre-test, medida intermedia y post-test). El método de aplicación (i.e., online o en papel) fue elegido por los centros educativos, garantizando siempre la confidencialidad y voluntariedad de la participación, con una duración aproximada de 25 minutos. Además, se realizaron grabaciones de las clases para obtener datos observacionales, coincidiendo con las medidas cuantitativas de las fases intermedia y post-test. El acceso a los datos estuvo restringido al investigador principal, quien veló por la confidencialidad de estos y eliminó los cuestionarios incompletos o con errores.

3.4 Muestreo y Participantes

Para llevar a cabo la presente Tesis Doctoral, se realizaron tres recogidas de datos, bajo un muestreo no probabilístico por conveniencia. En los dos primeros estudios, de carácter transversal, se realizaron dos tomas de datos independientes. Sin embargo, dado que la población diana estaba constituida por docentes de EF en activo en la Comunidad Autónoma de Aragón, algunos participantes coincidieron en ambas muestras. Las recogidas de datos se realizaron en marzo de 2021 y marzo de 2022, respectivamente. En el cuarto estudio, se implementaron tres fases de recogida de datos

cuantitativos: en diciembre de 2023 (i.e., pre-test – T1), marzo de 2024 (i.e., medida intermedia – T2) y junio de 2024 (i.e., post-test – T3). Además, se llevaron a cabo dos momentos de evaluación observacional, correspondientes a T2 y T3, mediante la grabación de sesiones de EF.

Aunque el muestreo de cada uno de los estudios se describe con mayor detalle en el apartado 4 de la Tesis Doctoral, la Tabla 1 resume las características principales de los participantes en las distintas muestras de los estudios.

Tabla 1.

Características de los docentes de EF participantes en los estudios.

	Muestra I (Estudio 1)	Muestra II (Estudio 2)	Muestra III (Estudio 4)	
<i>n</i>	667 docentes	640 docentes	17 docentes	813 estudiantes
Género	63.77% hombres	63% hombres	88.24% hombres	47.15% chicas
Edad	37.86(DT=8.11)	35.33(DT=9.24)	31.12(DT=5.33)	14.73(DT=1.26)
Etap educativa	46.30% Secundaria	44.22% Secundaria	100% Secundaria	
Experiencia docente	10.77(DT=8.52)	10.61 (DT=8.25)	4.87 (DT=4.72)	-

3.5 Variables e Instrumentos

Para la evaluación de las variables incluidas en cada uno de los estudios, se emplearon diferentes instrumentos, previamente validados y/o adaptados al contexto español. Aunque en el siguiente apartado de la Tesis Doctoral (i.e., “4. Estudios”) se proporcionará una descripción detallada de cada uno de estos instrumentos, la Tabla 2 presenta un resumen de estos.

Asimismo, en cada estudio se recopilaban diversas variables sociodemográficas tanto de los docentes (i.e., Estudios 1, 2 y 4) como de los estudiantes (i.e., Estudio 4). En el caso de los docentes, se obtuvieron datos relativos a la edad, género, etapa educativa, años de experiencia docente, tipo de escuela (pública o privada) y ubicación del centro educativo (rural o urbana). Para los estudiantes, se recogieron datos sobre el género, edad y curso académico.

Tabla 2.

Variables, factores e instrumentos utilizados en cada uno de los estudios.

Variables y factores	Instrumentos	Estudios
1. Estilo motivacional docente (percibido por docentes): <i>- Apoyo a la autonomía, estructura, control y caos</i>	Situations-in-School Questionnaire in PE (SIS-PE; Burgueño et al., 2024 versión docentes)	1, 2, 4
2. Estilo motivacional docente (percibido por estudiantes): <i>- Apoyo a la autonomía, estructura, control y caos</i>	Situations-in-School Questionnaire in PE (SIS-PE; Burgueño et al., 2024 versión alumnado)	4
3. Estilo motivacional docente (medida observacional): <i>- Apoyo a la autonomía, estructura, control y caos</i>	SIS-PE-Coder (Van Doren et al., 2023).	4
4. Satisfacción y frustración de las NPB (docentes): <i>- Autonomía, competencia y relación social</i>	BPN Satisfaction at Work Scale (Abós, Sevil Serrano, et al., 2018) and BPN Satisfaction and Frustration Scale (Chen et al., 2015)	1, 4
5. Satisfacción y frustración de las NPB (estudiantes): <i>- Autonomía, competencia y relación social</i>	BPN Satisfaction and Frustration Scale (Chen et al., 2015; Zamarripa et al., 2020)	4
6. Motivación por la enseñanza (docentes): <i>- Motivación intrínseca, identificada, introyectada, externa y desmotivación</i>	Motivation for Teaching in Secondary Education (Abós, Sevil-Serrano et al., 2018).	1,2
7. Satisfacción laboral (docentes)	Pregunta ad-hoc: ¿Cómo de satisfecho o insatisfecho estás con tu trabajo como docente de EF?	2
8. Satisfacción laboral (docentes)	Teacher Job Satisfaction Scale (TJSS; Abós et al., 2019; Skaalvik & Skaalvik, 2011)	4
9. Rendimiento profesional (docentes)	Pregunta ad-hoc: ¿Valore su satisfacción con su desempeño profesional este curso académico	2,4
10. Agotamiento emocional (docentes)	Maslach Burnout Inventory-General Survey (Gil-Monte et al., 2002).	4
11. Intención de ser físicamente activo (estudiantes)	Theory of Planned Behaviour Questionnaire (Tirado-González et al., 2012).	4
12. Experiencias en EF	Pregunta ad-hoc: ¿Cómo son sus experiencias en las clases de EF?	4
13. Aprendizaje en EF	Pregunta ad-hoc: ¿Cuánto aprendes en EF?	4

3.6 Análisis de Datos

A continuación, se ofrece un resumen de los análisis estadísticos empleados en cada uno de los cuatro estudios que componen la presente Tesis Doctoral. No obstante, tal como se ha mencionado en los apartados anteriores de la metodología general, el apartado 4 “Estudios” proporciona una descripción más detallada y específica para cada uno de los estudios.

De manera general, se llevaron a cabo los siguientes análisis preliminares en los cuatro estudios. En primer lugar, se calcularon los estadísticos descriptivos (M y DT) para todas las variables. Además, se evaluó la fiabilidad de los instrumentos mediante el coeficiente Alfa de Cronbach (α) y/o el coeficiente Omega de McDonald (ω), con el objetivo de asegurar que los ítems que componen cada escala o factor capturan adecuadamente el constructo teórico. Posteriormente, se realizó un Análisis Factorial Confirmatorio (CFA, por sus siglas en inglés) para cada uno de los instrumentos empleados, con el fin de verificar empíricamente que la estructura teórica subyacente en las escalas se reflejaba en los datos recogidos, asegurando así la validez del instrumento en la muestra estudiada. A continuación, se presentan los análisis específicos empleados en cada estudio para abordar sus respectivos objetivos.

En el Estudio 1, tras los análisis preliminares, se calcularon las correlaciones bivariadas de Pearson para las variables continuas y las correlaciones de Spearman para las variables categóricas. A continuación, se realizaron análisis univariantes de varianza de forma secuencial, aplicando la corrección de Bonferroni, para examinar las diferencias de medias en función del género, la etapa educativa y la experiencia docente sobre el estilo motivacional docente, la satisfacción y frustración de las NPB, y la motivación hacia la enseñanza. El nivel de significación estadística fue $p < 0.05$. Los tamaños del efecto fueron pequeños, moderados o grandes, con valores de eta-cuadrado parcial superiores a 0.01, 0.06 y 0.14, respectivamente (Cohen, 2013). Posteriormente, se implementó un modelo de ecuaciones estructurales (SEM, por sus siglas en inglés) de dos pasos (Kline, 2018) para probar las relaciones entre la satisfacción y frustración de las NPB con el estilo motivacional docente, a través de la motivación. El SEM se ajustó con el estimador robusto de máxima verosimilitud (MLR, por sus siglas en inglés) debido a su robustez frente a la no normalidad de los datos, lo que lo hace adecuado para escalas tipo Likert con cinco o más categorías de respuesta (Muthén & Muthén, 1997-2018). El género, la etapa educativa y la experiencia docente se incluyeron como

covariables. Como referencia para un ajuste aceptable se consideraron valores de hasta 5 para el coeficiente χ^2/gl , superiores a 0.90 para *comparative fit index* (CFI) y *Tucker-Lewis index* (TLI), e inferiores a 0.08 para *standardised root mean square* (SRMR) y *root mean square error of approximation* (RMSEA) (Kline, 2018).

En el segundo estudio, se llevó a cabo un análisis de perfiles latentes (LPA, por sus siglas en inglés) para identificar las combinaciones de estilos motivacionales que el profesorado de EF utiliza durante sus clases. Los modelos LPA se estimaron utilizando el estimador MLR, con 5000 valores iniciales aleatorios, 1000 iteraciones y 200 optimizaciones finales (Muthén y Muthén 1997-2018). La etapa educativa de los docentes se incluyó como covariable. Se comenzó con un modelo de dos perfiles, añadiéndose perfiles adicionales de manera iterativa hasta llegar a un máximo de seis. Para seleccionar el modelo más adecuado, se siguieron los siguientes criterios: a) *Akaike Information Criterion* (AIC), *Bayesian Information Criterion* (BIC), *Sample-Sized Adjusted Bayesian Information Criterion* (SSA-BIC), sugiriendo que valores más bajos indican un mejor ajuste del modelo; b) la prueba de *Bootstrap Likelihood Ratio* (BLR), indicando que un valor p significativo refleja que la solución retenida se ajusta mejor que otras soluciones; c) Entropía, con valores superiores a .70 como indicativos de una precisión de clasificación satisfactoria; y d) un tamaño de perfil de al menos el 5% de los participantes, para evitar una posible sobre-extracción (Weller et al., 2020). Además de los criterios estadísticos, se consideró la interpretabilidad y el significado teórico. Para examinar las diferencias en la calidad de la motivación hacia la enseñanza, la satisfacción laboral y el rendimiento profesional entre los perfiles retenidos, se utilizó el método de *Bolck-Croon-Hagenaars* (BCH).

En el cuarto estudio, se realizaron las pruebas de Levene y Kolmogorov-Smirnov para garantizar la igualdad de varianzas y la distribución normal de los datos, respectivamente ($p > 0.05$). Se examinaron los efectos de la intervención aplicada en las clases de EF sobre las variables de estudio, tanto para los docentes como para los estudiantes. Para analizar estos efectos, se llevó a cabo un análisis multivariante de covarianza mixto (MANCOVA) con un factor de medidas repetidas 3 x 2 (Tiempo x Grupo) para los estudiantes y un análisis multivariante mixto (MANOVA) con un factor de medidas repetidas 3 x 2 (Tiempo x Grupo) para los docentes. El género se incluyó como covariable en el análisis de los estudiantes (no se incluyó en los docentes debido a que el grupo experimental estaba compuesto únicamente por hombres). Se realizaron pruebas univariantes con corrección de Bonferroni para determinar las diferencias entre

los grupos (i.e., experimental vs. control) y dentro de los grupos (i.e., pre-test, medida intermedia y post-test). Los tamaños del efecto se interpretaron según los criterios de Cohen (2013), considerándose pequeños (.01), moderados (.06) y grandes (.14) (Field, 2017). Para evaluar la fidelidad del programa de formación, se utilizaron las puntuaciones obtenidas a partir de la medida observacional SIS-PE-Coder (Van Doren et al., 2023).

Todos los análisis se llevaron a cabo utilizando los programas IBM SPSS Statistics v.25.0 y Mplus 8.4.

4. Estudios

4. Estudios

4.1. Estudio 1: What Factors Are Associated With Physical Education Teachers' (De)Motivating Teaching Style? A Circumplex Approach

Situación actual: Publicado

Revista: European Physical Education Review (EPER)

Factor de impacto (cuartil): 2.6 (Q1)

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Abstract

Building upon the circumplex approach to (de)motivating styles defined by self-determination theory, this research aimed: 1) to analyse the extent to which physical education (PE) teachers' (de)motivating teaching approaches differ across gender, school level, and years of teaching experience, and 2) to test paths from PE teachers' need-based experiences to their (de)motivating teaching approaches, via motivation quality. A purposive and cross-sectional sample of 667 Spanish PE teachers (63.7% male; 54.7% primary; mean teaching experience=10.77 years) participated. The overall results found that male, secondary school, and more experienced teachers scored lower on autonomy-supportive approaches, and higher on controlling and chaotic approaches. The findings also showed that, after controlling for gender, school level, and teaching experience, need satisfaction showed a direct significant effect on autonomous motivation and an indirect effect on participative, attuning, guiding, and clarifying approaches via autonomous motivation. Need frustration showed a direct significant effect on controlled motivation and amotivation and an indirect effect on demanding, domineering, abandoning, and awaiting approaches via controlled motivation and amotivation. Another noteworthy result is the positive relationship between need satisfaction and controlled motivation. Our results underscore the role that PE teachers' personal traits play in the adaptive motivational mechanisms underlying their variety of (de)motivating approaches to PE teaching.

Keywords

Basic psychological needs, behavioural regulation, teaching behaviour, need-supportive style, need-thwarting style.

Introduction

Self-determination theory (SDT; Ryan & Deci, 2017) constitutes a broad theoretical structure for analysing motivation and behaviour. Growing attention is being given to exploring the associations between physical education (PE) teachers' motivational processes and their teaching behaviour. Recently, Aelterman et al. (2019) proposed an SDT-based circumplex approach to more holistically conceptualising (de)motivating styles by introducing the styles of autonomy support (i.e. participative and attuning approaches), structure (i.e. guiding and clarifying approaches), control (i.e. demanding and domineering approaches), and chaos (i.e. abandoning and awaiting approaches) within a circular structure according to their level of need-supportiveness and teacher directiveness. Previous SDT-grounded research, conducted with in-service generalist teachers (i.e. not specialist PE teachers), has provided clues on how differentiated motivational processes contribute to explaining a specific (de)motivating style (Abós et al., 2019; Abós, Haerens, et al., 2019; Cheon et al., 2020). However, very little is currently known about the role that PE teachers' need-based experiences and motivation could play in the variety of (de)motivating approaches for effective classroom management. Further, there is a need to explore to what extent the use of PE teachers' (de)motivating styles would depend on their personal traits (e.g., gender, school level, and years of teaching experience). Guided by the SDT-based circumplex approach, the present research aspires to expand previous evidence by analysing if there is an association between PE teachers' perceptions of need-based experiences and their (de)motivating teaching approaches (via motivation quality), considering the potential differences in their personal traits.

Self-Determination Theory: Basic Psychological Needs and Motivation

Central to SDT is the assumption of three basic psychological needs (BPN) (i.e., autonomy, competence, and relatedness) which are universal psychological nutrients for growth, adjustment, and wellness. Indeed, it is suggested that individuals' varying perceptions of these BPN are influenced by how they interpret the contextual, motivational, and social factors in their environment (Bartholomew et al., 2014; Pelletier et al., 2002). SDT distinguishes between a bright side of functioning based on BPN satisfaction, and a dark side based on BPN frustration (Vansteenkiste et al., 2020). Autonomy satisfaction refers to PE teachers' perceptions of making their own decisions and having a feeling of willingness in their work, while autonomy frustration concerns a feeling of obligation and pressure in work-related tasks. Competence satisfaction refers

to PE teachers' perceptions of success and effectiveness in the actions to be developed, while competence frustration concerns when they experience feelings of ineffectiveness and failure in work-related tasks. Relatedness satisfaction refers to PE teachers' perceptions of being connected and integrated with the people they work with, while relatedness frustration concerns when they feel socially rejected and excluded in their working environment (Vansteenkiste et al., 2020).

SDT argues that BPN satisfaction and frustration can occur simultaneously in PE, with each contributing to a specific quality of motivation (Abós et al., 2019; Abós, Haerens, et al., 2019; Bartholomew et al., 2014). Three motivational qualities are differentiated along a self-determination continuum depending on the relative autonomy level present in each of them (Ryan & Deci, 2020). At one end of the continuum lies autonomous motivation, which refers to undertaking a behaviour for inherent pleasure, interest, and curiosity (i.e., intrinsic motivation), and personal value and recognition of the benefits that it brings (i.e., identified regulation). In the centre of the continuum stands controlled motivation, which refers to undertaking a behaviour to comply with self-imposed pressures and self-esteem contingencies (i.e., introjected regulation) and social environment pressures based on rewards and punishments (i.e. external regulation). At the opposite end of the continuum lies amotivation, which expresses the total absence of intention toward the target behaviour (Ryan & Deci, 2017). Prior research has shown that BPN satisfaction is positively related to autonomous motivation (Abós et al., 2019; Abós, Haerens, et al., 2019), while BPN frustration is positively related to controlled motivation and amotivation (Collie et al., 2016; Van den Berghe et al., 2014).

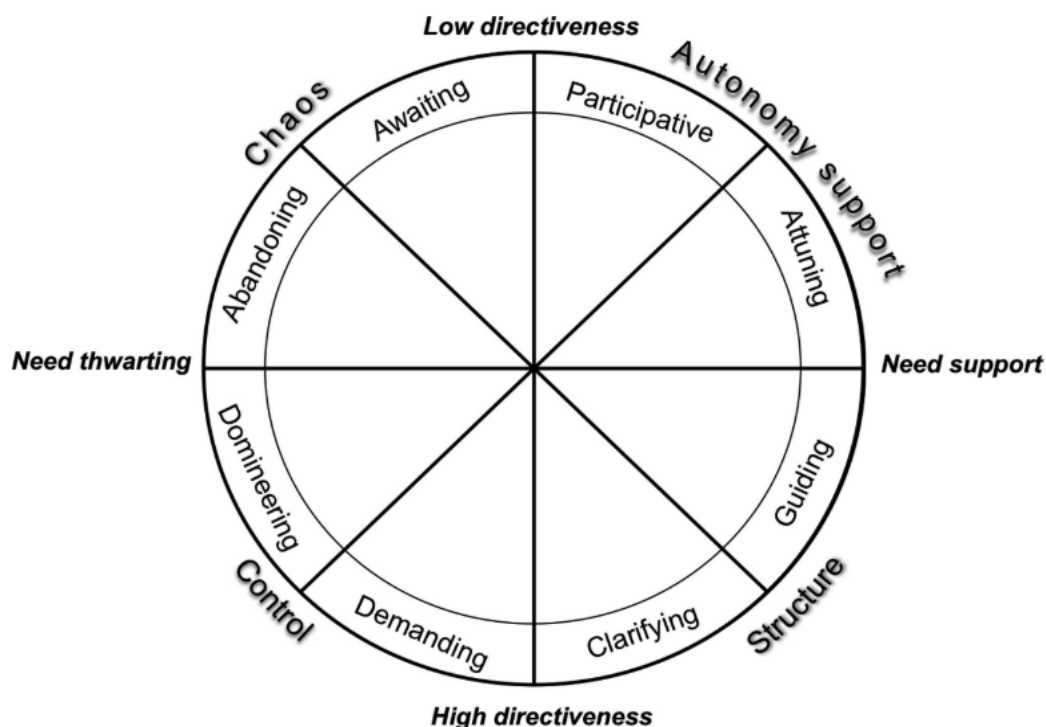
Circumplex Approach: (De)Motivating Teaching Styles in PE

SDT-based studies (Abós, Haerens, et al., 2018; Vermote et al., 2020) have shown the interplay between teachers' need-based experiences and motivation and their (de)motivating styles in PE lessons. To study teachers' (de)motivating styles from a more integrative and holistic perspective, Aelterman et al. (2019) put forward an SDT-based circumplex model (see Figure 1) that combines need-supportiveness (on the x-axis, i.e., the degree to which teachers support/thwart students' needs) with directiveness (on the y-axis, i.e., the extent to which teachers take the lead in learning interactions). According to the intersection of these two dimensions, autonomy support and structure constitute motivating styles, given that both are need-supportive practices, with autonomy support being low in directiveness and structure being highly directive.

Control and chaos represent demotivating styles since both are need-thwarting practices, with control being high in directiveness and chaos being low on this dimension.

Figure 1.

Circumplex approach to (de)motivating styles in PE.



Note. Graphical representation taken from Aelterman et al. (2019).

The circumplex model allows for a more refined vision of the overarching (de) motivating styles of teachers' autonomy support, structure, control, and chaos, as each style can be implemented in two more specific teaching approaches (Aelterman et al., 2019). Regarding motivating styles, autonomy support is characterised by understanding attitudes toward students (Reeve & Cheon, 2021). When PE teachers are autonomy-supportive, they offer decision-making power to their students in terms of learning (i.e., participative approach). They also underline the relevance of tasks, aligning them with students' interests and preferences, and validating their views (i.e., attuning approach) (Burgueño, Abós, et al., 2024). Structure encompasses students' progress and process, aiming for alignment with their ability levels, strengths, and learning potential (Skinner et al., 1998). When structuring, PE teachers display confidence in students' skills for task accomplishment and provide them with useful and adjusted information and feedback to support their progress (i.e., guiding approach).

They also communicate learning goals and expectations clearly, and consistently monitor their progress (i.e., clarifying approach) (Escriva-Boulley et al., 2021).

Concerning demotivating styles, control refers to a pressuring attitude toward students (Bartholomew et al., 2009). When they are controlling, PE teachers take a tunnel-perspective in which their agenda and way of achieving task completion become prioritised by using either explicit behaviour-focused strategies, such as strict commands, coercive language, contingent rewards, and threats of sanctions (i.e., demanding approach), or manipulative person-targeted strategies such as guilt-induction, public shaming, expressions of disapproval, and withdrawal of attention (i.e., domineering approach) (Burgueño, Haerens, et al., 2024). Chaos is characterised by a laissez-faire attitude toward students (Jang et al., 2010). When they are chaotic, PE teachers leave students to their own devices, giving up after repeatedly intervening in the classroom (i.e., abandoning approach), or waiting to see how things unravel when directions are required so that students take the initiative themselves (i.e., awaiting approach) (Escriva-Boulley et al., 2021).

A growing body of SDT-grounded research with teachers has shown that autonomous motivation is positively associated with autonomy support (Abós, Haerens, et al., 2018), and with the two autonomy-supportive and structuring approaches (Escriva-Boulley et al., 2021; Vermote et al., 2020). A negative relationship between teachers' autonomous motivation and the abandoning approach was also found (Escriva-Boulley et al., 2021; Vermote et al., 2020). Teachers' controlled motivation was positively associated with demanding and abandoning approaches, but not with the awaiting approach (Escriva-Boulley et al., 2021; Vermote et al., 2020). However, the relationship between controlled motivation and the domineering approach remains unclear given that Escriva-Boulley et al. (2021) revealed a negative relationship, while Vermote et al. (2020) reported that both variables were unrelated. It is important to note that cross-relationships between controlled motivation and need-supportive styles were inconsistent, since Escriva-Boulley et al. (2021) found non-significant associations, whereas Vermote et al. (2020) showed a negative association of controlled motivation with both autonomy-supportive approaches. Moreover, teachers' amotivation was positively related to demanding, domineering, and abandoning approaches (Escriva-Boulley et al., 2021; Vermote et al., 2020), while being negatively associated with the autonomy-supportive style and the guiding approach (Abós, Haerens et al., 2018; Vermote et al., 2020). Therefore, there is a need for further research to deepen insight

into the interplay between PE teachers' quality of motivation and their (de)motivating style, via the circumplex lens.

Socio-Demographic and/or Personal Influencing Factors

Previous research has suggested that teachers' socio-demographic and personal traits are associated not only with their motivational processes for teaching, but also with their variety of (de)motivating styles and approaches used for effective classroom management (Escriva-Boulley et al., 2021; Hellebaut et al., 2023). Despite little attention being given to the distinctive role that socio-demographic and personal variables could have in teachers' motivational processes and behaviour, it seems that gender, school level, and years of teaching experience have been identified as the strongest determinants of their teaching style (Hellebaut et al., 2023; Vermote et al., 2023).

Regarding teachers' gender, Vermote et al. (2020, 2023) revealed that male teachers scored higher than female teachers on the autonomy-supportive style and the two chaotic approaches. Conversely, Escriva-Boulley et al. (2018) and Burel et al. (2021) reported that teachers' gender non-significantly predicted their autonomy-supportive and structuring styles. In addition, Burel et al. (2021) found that teachers' gender was unrelated to control, while it positively predicted relatedness support. Although the research by Escriva-Boulley et al. (2018) did not consider controlling and chaotic styles, and Burel et al. (2021) failed to operationalise (de)motivating teaching styles from a circumplex approach, both shed some light on the differentiated nature of teachers' gender in the associations with their (de)motivating style in lessons.

Moreover, only two previous studies examined the differences by school level in (de)motivating styles and approaches. While Vermote et al. (2023) reported that primary and secondary school teachers did not differ in autonomy support, structure, control, and chaos, Vermote et al., (2020) revealed that university teachers scored lower in the participative approach than secondary school teachers.

Concerning teaching experience, less experienced teachers scored lower than more experienced teachers in guiding, clarifying, and demanding approaches (Hellebaut et al., 2023). Similarly, more experienced teachers were more autonomy-supportive and structuring (Vermote et al., 2023), in addition to obtaining higher values in demanding, domineering, and abandoning approaches than less experienced ones (Hellebaut et al., 2023; Vermote et al., 2020). However, much of the research reported that years of teaching experience are not significantly associated with teachers' autonomy support

(Burel et al., 2021; Escriva-Boulley et al., 2018; Hellebaut et al., 2023; Vermote et al., 2020), while a few studies showed that teaching experience was unrelated to structure (Vermote et al., 2020), control (Burel et al., 2021), and chaos (Vermote et al., 2020).

In light of the unclear and inconclusive results from previous studies conducted with generalist teachers, there is a need to gain a better understanding of the potential role that gender, school level, and teaching experience may play in the adoption of each (de)motivating approach used by teachers in PE lessons. This may allow us to gather a substantial basis of evidence that could help to develop training programs to assist PE teachers in improving the quality of their motivational process and teaching behaviour by considering their personal and working characteristics.

The Present Study

Little is currently known about the underlying motivational mechanisms that lead PE teachers to rely on a variety of (de)motivating approaches to achieve optimal PE classroom management. Much of SDT-based research conducted to date with generalist teachers has considered teacher behaviour from a categorical and black-and-white viewpoint (i.e., need-supportive *versus* need-thwarting practices), while the SDT-based circumplex approach to (de)motivating styles relies on a gradual and holistic perspective where the differences between teaching approaches are more progressive. These differences are reflected in the extent to which they are need-supportive or need-thwarting, and in the teacher's degree of directiveness (Burgueño, Abós, et al., 2024). Indeed, this gradual vision of teacher behaviour may shed light on how differentiated motivational mechanisms make PE teachers shift from one approach to another along the circumplex, depending on obstacles and facilitators found in the PE classroom. Among these obstacles and facilitators, previous SDT-grounded studies have suggested that generalist teachers' personal traits might be associated with their teaching behaviour (e.g., Vermote et al., 2020, 2023). However, regarding PE teachers, there is still a lack of evidence regarding the specific role that these personal traits may play in the motivational mechanisms and teaching behaviours underlying their practice.

Therefore, the present research had two objectives. The first objective was to analyse the extent to which PE teachers' (de)motivating teaching approaches differ across gender, school level, and years of teaching experience. Given the unclear and inconclusive results from previous studies with generalist teachers, we did not formulate any hypotheses about this objective. The second objective was to test paths from PE teachers' need-based experiences to their own (de)motivating teaching approaches, via

motivation quality. Guided by SDT and previous research (Abós et al., 2019; Abós, Haerens, et al., 2019; Collie et al., 2016; Van den Berghe et al., 2014), we hypothesised that PE teachers' BPN satisfaction would positively predict autonomous motivation, while their BPN frustration would positively predict controlled motivation and amotivation. We also hypothesised that autonomous motivation would positively predict the two autonomy-supportive and structuring approaches. Given the differences found in controlled motivation and its relationship to (de)motivating approaches (Escriva-Boulley et al., 2021; Vermote et al., 2020), it is difficult to establish a clear and precise hypothesis. In contrast, the results for amotivation are quite clear (Escriva-Boulley et al., 2021; Vermote et al., 2020), as it is very likely that amotivation will positively predict control and chaos.

Method

Participants and Procedures

There were 667 participants (422 male, 63.3%), all PE teachers, aged between 22 and 67 years old ($M_{age}=37.86$; $SD=8.11$), from different mixed schools located in the northeastern part of Spain. They worked both in primary ($n=365$, 54.7%) and secondary ($n=302$, 45.3%) schools, and self-reported teaching experience ranging from 1 to 35 years ($M_{experience}=10.77$; $SD=8.52$). Primary PE teachers are required to deliver 25 hours of teaching per week, whereas secondary PE teachers are expected to teach between 18 and 21 hours per week.

Participants were recruited by a non-probabilistic purposive method. Specifically, short and direct messages were disseminated in different online forums related to PE (e.g., WhatsApp, Facebook, and Twitter) aimed at capturing the PE teachers' attention. These messages included a weblink providing access to the online-based questionnaire where PE teachers could find a brief explanation of the study's objectives and the main researcher's contact details. This online-based questionnaire, which took approximately 25 minutes to complete, was available for 30 days. Participation was voluntary and anonymous. The study was approved by the Ethics Committee of the University of Extremadura (code: 153/2022) and followed all ethical procedures established in the Helsinki Declaration.

Instruments

Socio-Demographic Variables. Data related to gender (i.e., male/female), school level (i.e., primary school/secondary school), and years of experience as PE teachers were collected. Years of experience, consistent with prior educational research

(e.g., Gutiérrez-Díaz del Campo et al., 2016) were categorised as low (i.e., 0-9 years), medium (i.e., 10-19 years), high (i.e., 20-29 years), and very high (i.e., +29 years).

BPN Satisfaction and Frustration. To assess PE teachers' perception of their BPN satisfaction and frustration, the Spanish version of the Basic Psychological Need Satisfaction and Frustration Scale (Chen et al., 2015) was used. This instrument includes 24 items (four items per dimension) and taps into autonomy satisfaction (e.g., "I can make my own decisions"), autonomy frustration (e.g., "I feel forced to do a lot of things"), competence satisfaction (e.g., "I feel competent in my job"), competence frustration (e.g., "I feel disappointed with many of my job performances"), relatedness satisfaction (e.g., "When I am with colleagues at work, I feel they listen to me"), and relatedness frustration (e.g., "I feel that colleagues dislike me"). Items were rated on a five-point Likert scale from 1 (strongly disagree) to 5 (strongly agree). Consistent with SDT-based research (e.g., Moè & Katz, 2020), composite scores for BPN satisfaction and frustration were estimated by using autonomy, competence, and relatedness satisfaction and frustration, respectively. In the current study, Cronbach's alphas were .83 and .75 for BPN satisfaction and frustration, respectively. The hierarchical confirmatory factorial analysis (CFA) models for BPN satisfaction ($\chi^2(df=2) = 2.965$, $p=.227$, $\chi^2/df=1.48$; comparative fit index (CFI)=.99; Tucker-Lewis index (TLI)=.99; standardised root mean squared residual (SRMR)=.008; root mean square error of approximation (RMSEA)=.027 (90%CI=.001-.086)) and BPN frustration ($\chi^2(df=2)=3.439$, $p=0.179$, $\chi^2/df=1.72$; CFI=.99; TLI=.99; SRMR=.011; RMSEA=.033 (90%CI=.001-.090)) indicated a good fit.

Motivation for Teaching. To assess PE teachers' perception of their motivation for teaching, the Spanish version of the Motivation for Teaching in Secondary Education (Abós, Sevil-Serrano, et al., 2018) was used. The scale starts with the stem "I get involved in teaching because..." followed by 19 items measuring intrinsic motivation (four items; e.g., "Teaching is fun"), identified regulation (four items; e.g., "This is an important personal choice for me"), introjected regulation (four items; e.g., "I want to give others the impression that I am a good teacher"), external regulation (four items; e.g., "Otherwise, I would be disappointed in myself"), and amotivation (three items; e.g., "I don't know, I feel like I am wasting my time when I teach"). Responses were provided on a five-point Likert scale from 1 (strongly disagree) to 5 (strongly agree). Following previous SDT-based research (e.g., Abós et al., 2019; Van den Berghe et al., 2014), composite scores both for autonomous motivation (including

intrinsic motivation and identified regulation) and controlled motivation (including introjected and external regulation) were computed. In this study, Cronbach's alphas for autonomous and controlled motivation, and amotivation were .83, .74, and .52, respectively. The five-factor model obtained a good fit: $\chi^2(df=135) = 369.373$, $p < .001$, $\chi^2/df = 2.74$; CFI=.91; TLI=.90; SRMR=.059; RMSEA=.051 (90%CI=.045–.057).

(De)Motivating Teaching Approaches. To assess PE teachers' perception of their (de)motivating teaching approaches, the Spanish version of the Situations-in-School Questionnaire in Physical Education (SIS-PE; Burgueño, Abós, et al., 2024) was used. The SIS-PE includes 12 typical PE-classroom situations consisting of four items each (i.e., 48 items). Autonomy-supportive items are operationalised into participative (four items; e.g., “You invite students to suggest a set of norms or rules”) and attuning (eight items; e.g., “Offer enjoyable, interesting and highly attractive tasks”) approaches. Structure items are operationalised into guiding (seven items; e.g., “You give them positive feedback while offering help and guidance when necessary”) and clarifying (five items; e.g., “You implement an easy-to-follow and clear organisation”) approaches. Control items are operationalised into demanding (seven items; e.g., “Plan a session for all students to follow. No exceptions or excuses”) and domineering (five items; e.g., “You insist that they must get over it and act more maturely”) approaches. Chaos items are operationalised into abandoning (eight items; e.g., “Don't worry too much about their anxiety, as it will go away on its own”) and awaiting (four items; e.g., “You start the class and let it develop”) approaches. Items were rated on a seven-point Likert scale from 1 (it does not define me at all) to 7 (it defines me perfectly). In this study, Cronbach's alphas were .54, .68, .67, .51, .66, .73, .74, and .66 for participative, attuning, guiding, clarifying, demanding, domineering, abandoning, and awaiting approaches, respectively. The eight-factor model had an acceptable fit: $\chi^2(df=180) = 500.609$, $p < .001$, $\chi^2/df = 2.78$; CFI=.90; TLI=.90; SRMR=.053; RMSEA=.056 (90% CI=.051–.062).

Data Analysis

Firstly, descriptive statistics and Cronbach's alpha reliability were calculated for all study variables. Although there is a widespread agreement on .70 as cut-off point for an acceptable reliability level, a growing body of research suggests the need to interpret reliability as a grayscale such that scores between .90 and .95 are interpreted as excellent reliability levels, scores .80 and above as good, scores .70 and above as acceptable, scores .60 and above as reasonable, scores .50 and above as fair, and scores

below .50 as unacceptable (George and Mallery, 2003; Hernaez, 2015). Secondly, Pearson's correlations were computed for continuous variables and Spearman's correlations for categorical variables. Thirdly, univariate analyses of variance (ANOVAs) with the Bonferroni correction were sequentially performed to examine mean differences in their (de)motivating approaches based on teachers' gender, school level, and teaching experience. Additionally, differences in PE teachers' need-based experiences and motivation were analysed (see Supplemental material). The statistical significance level was $p < .05$. Effect sizes were small, moderate, or large with partial eta-squared values above .01, .06, and .14 (Cohen, 2013).

Fourthly, a two-step structural equation model (SEM) (Kline, 2018) using the Robust Maximum Likelihood (MLR) estimator was run to test paths from PE teachers' need-based experiences to their (de)motivating approaches via motivation. Gender, school level, and teaching experience were included as covariates. The first step involved analysing the robustness of the measurement model, in which all target variables were freely correlated. The second step involved testing the predictive relationships between the variables within a structural model. The SEM was estimated by the MLR estimator because it provides fit and standard error rates that are robust to non-normality, and by Likert-type scales that include five or more response categories (Muthén & Muthén, 1997-2018). Values up to 5 for the χ^2/df coefficient, over .90 for CFI and TLI, and below .08 for SRMR and RMSEA represent an acceptable fit (Kline, 2018). Following Hayes (2017), an indirect effect is significant ($p < .05$) when its 95% confidence interval (95%CI) excludes zero. All analyses were conducted using SPSS 29.0 and Mplus 8.4 (Muthén & Muthén, 1997-2018).

Results

Differences by Gender, School Level, and Teaching Experience in (De)Motivating Teaching Approaches

Table 1 shows that male PE teachers scored significantly higher on demanding and domineering approaches. Regarding school level (Table 1), primary school PE teachers scored significantly higher on the two autonomy-supportive approaches (i.e., participative and attuning). Secondary school PE teachers, on the other hand, scored significantly higher on the two controlling (i.e., demanding and domineering) and chaotic (i.e., abandoning and awaiting) approaches.

Table 2 shows that PE teachers with low and medium experience scored significantly higher than those with high and very high experience in the attuning approach. PE teachers with very high experience scored the highest in demanding, domineering, and abandoning approaches. PE teachers with very high experience also scored significantly higher than those with medium experience in awaiting approach. PE teachers with high experience scored significantly higher than those with medium experience in the abandoning approach.

Table 1.

Mean differences by gender and school level in (de)motivating teaching approaches.

	Female	Male				Primary	Secondary			
	<i>M(SD)</i>	<i>M(SD)</i>	F	<i>p-value</i>	η^2_p	<i>M(SD)</i>	<i>M(SD)</i>	F	<i>p-value</i>	η^2_p
(De)motivating teaching approaches										
Participative	5.16(0.99)	4.91(1.05)	9.14	.003	.01	5.15(0.97)	4.83(1.08)	16.73	<.001	.03
Attuning	5.83(0.68)	5.78(0.69)	1.24	.266	<.01	5.85(0.66)	5.74(0.72)	4.60	.032	.01
Guiding	6.10(0.54)	6.03(0.61)	1.70	.193	<.01	6.07(0.60)	6.02(0.56)	1.18	.277	<.01
Clarifying	5.61(0.87)	5.55(0.84)	1.01	.315	<.01	5.54(0.89)	5.61(0.79)	1.19	.275	<.01
Demanding	3.14(1.11)	3.31(1.03)	3.85	.050	.01	3.03(1.11)	3.51(1.05)	34.64	<.001	.05
Domineering	2.39(1.07)	2.57(1.10)	4.32	.038	.01	2.28(1.00)	2.78(1.14)	37.67	<.001	.05
Abandoning	1.61(0.60)	1.75(0.69)	7.42	.007	.01	1.58(0.63)	1.85(0.67)	28.85	<.001	.04
Awaiting	2.72(1.16)	2.65(1.12)	0.51	.447	<.01	2.55(1.14)	2.82(1.11)	10.07	.002	.02

Note. Significantly different groups are shown by different letters in superscript.

Table 2.

Mean differences by years of teaching experience in (de)motivating teaching approaches.

	0-9	10-19	20-29	+29			
	<i>M(SD)</i>	<i>M(SD)</i>	<i>M(SD)</i>	<i>M(SD)</i>	F	<i>p</i>	η^2_p
(De)motivating teaching approaches							
Participative	5.01(1.03)	5.08(0.99)	4.91(1.13)	4.69(1.10)	1.41	.240	<.01
Attuning	5.86(0.69) ^a	5.83(0.65) ^a	5.57(0.70) ^b	5.57(0.77) ^{ab}	5.60	.001	.03
Guiding	6.06(0.61)	6.09(0.57)	5.97(0.47)	5.94(0.80)	1.27	.285	.01
Clarifying	5.57(0.85)	5.59(0.85)	5.54(0.85)	5.54(0.81)	0.09	.965	<.01
Demanding	3.19(1.04) ^a	3.17(1.04) ^a	3.33(1.06) ^a	4.39(1.08) ^b	11.31	<.001	.05
Domineering	2.50(1.10) ^a	2.41(1.09) ^a	2.52(1.00) ^a	3.34(1.13) ^b	5.70	.001	.02
Abandoning	1.70(0.62) ^a	1.59(0.59) ^a	1.80(0.67) ^a	2.26(1.20) ^b	9.33	<.001	.04
Awaiting	2.73(1.13) ^a	2.52(1.03) ^a	2.70(1.24) ^a	3.16(1.41) ^b	3.26	.021	.01

Note. Letters in superscript reported significantly different groups (Bonferroni's correction at $p < .0125$).

Table 3.*Descriptive statistics and correlations of the study variables.*

	<i>M(SD)</i>	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Need-based experiences																	
1. Need satisfaction	4.43(0.42)	-															
2. Need frustration	1.78(0.50)	-.11***	-														
Motivational quality for teaching																	
3. Autonomous motivation	4.66(0.44)	.05**	-.04*	-													
4. Controlled motivation	2.52(0.77)	-.01	.10***	.02	-												
5. Amotivation	1.12(0.34)	-.04**	.06***	-.05**	.04*	-											
(De)motivating teaching approaches																	
6. Participative	5.00(1.03)	.05**	-.03	.08***	-.08	.02	-										
7. Attuning	5.80(0.69)	.08***	-.07**	.09***	-.03	-.05**	.35***	-									
8. Guiding	6.05(0.58)	.09***	-.07**	.06**	-.07**	-.05***	.18***	.22***	-								
9. Clarifying	5.57(0.85)	.09***	-.03	.06**	.08*	-.03*	.20***	.21***	.17***	-							
10. Demanding	3.25(1.07)	-.01	.09***	-.04	.31***	.07***	-.15**	-.10**	-.05	.21***	-						
11. Domineering	2.51(1.09)	-.05*	.13***	-.05	.40***	.10**	-.22***	-.16***	-.12***	.17***	.74***	-					
12. Abandoning	1.70(0.66)	-.05**	.08***	-.05*	.13***	.07**	-.13***	-.14***	-.12***	-.03	.23***	.29***	-				
13. Awaiting	2.68(1.13)	-.06**	.12***	-.05*	.13**	.08**	-.11*	-.16***	-.15***	-.13*	.16***	.22**	.20***	-			
14. Gender	-	.00	.02	-.01	.07**	.01	-.06**	-.02	-.02	-.02	.05**	.04*	.03**	-.01	-		

15. School level	-	.01	.03	-.02***	.04	.02	-.09**	-.03*	-.01	.02	.11***	.12***	.05***	.03	.02*	-	
16. Teaching Experience	10.77(8.52)	.01	-.02	-.06**	-.07*	.05**	-.06	-.09***	-.02	-.01	.12**	.07	.05	.06	.02	.06***	-

Note. *** $p < .001$, ** $p < .01$, * $p < .05$.

Relationships Between Need-Based Experiences, Motivation, and (De)Motivating Approaches

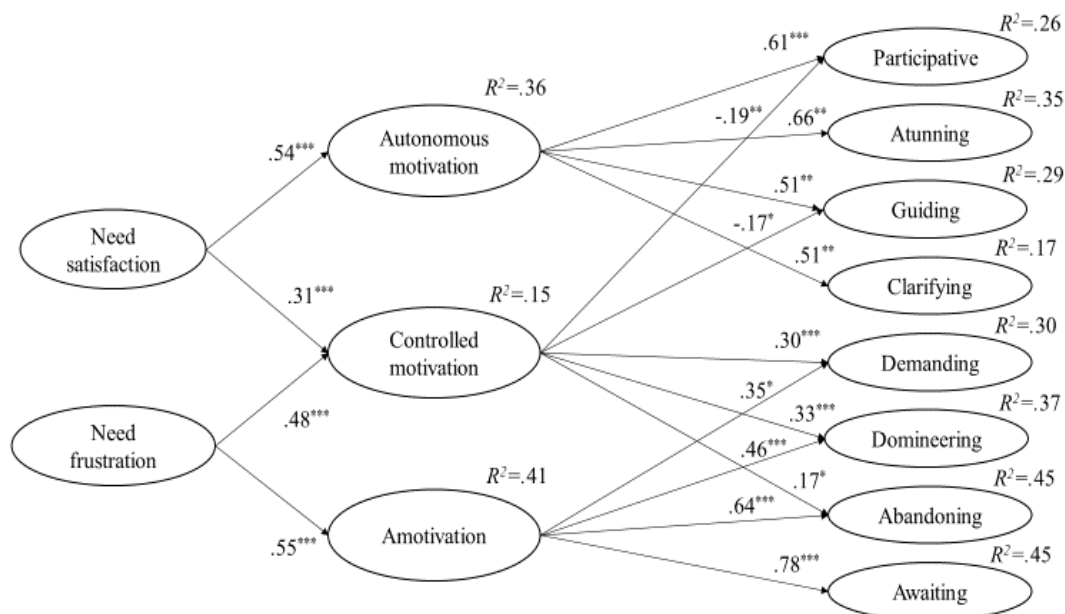
Table 3 reports descriptive statistics and correlations. Overall, correlations between most of the study variables were significant.

The measurement model ($\chi^2[df=778]=1532.330$, $p<.001$, $\chi^2/df=1.97$; CFI=.92; TLI=.90; SRMR=.043; RMSEA=.038, 90%CI=.035–.041) and the structural model ($\chi^2[df=800]=1590.542$, $p<.001$, $\chi^2/df=1.98$; CFI=.91; TLI=.90; SRMR=.047; RMSEA=.038, 90%CI=.036–.041) obtained acceptable fit-indices. Figure 2 shows that, after controlling for gender, school level, and teaching experience, PE teachers' BPN satisfaction positively predicted autonomous motivation ($\beta=.54$, $p<.001$) and controlled motivation ($\beta=.31$, $p<.001$), while BPN frustration positively predicted controlled motivation ($\beta=.48$, $p<.001$) and amotivation ($\beta=.55$, $p<.001$). In addition, autonomous motivation positively predicted participative ($\beta=.61$, $p<.001$), attuning ($\beta=.66$, $p=.001$), guiding ($\beta=.51$, $p=.003$), and clarifying ($\beta=.51$, $p=.009$) approaches. Controlled motivation negatively predicted participative ($\beta=-.19$, $p=.009$) and attuning ($\beta=-.17$, $p=.015$) approaches, whereas it positively predicted demanding ($\beta=.30$, $p<.001$), domineering ($\beta=.33$, $p<.001$), and abandoning approaches ($\beta=.17$, $p=.012$). Finally, amotivation positively predicted demanding ($\beta=.35$, $p=.014$), domineering ($\beta=.46$, $p<.001$), abandoning ($\beta=.64$, $p<.001$), and awaiting ($\beta=.78$, $p<.001$) approaches.

Regarding indirect effects, Table 4 shows that 18 of the 48 tested indirect effects between teachers' need-based experiences and (de)motivating approaches, via motivation, were significant. In particular, positive and significant indirect effects between teachers' BPN satisfaction with participative, attuning, guiding, and clarifying teaching approaches were found via autonomous motivation. Negative indirect effects between BPN satisfaction and frustration with participative and guiding approaches, as well as positive ones with demanding, domineering, and abandoning approaches, were found via controlled motivation. Positive indirect effects between teachers' BPN frustration with demanding, domineering, abandoning, and awaiting teaching approaches were found via amotivation.

Figure 2.

Paths from need-based experiences to teaching approaches via motivational quality in physical education teachers.



Note. Only significant paths are shown. *** $p < .001$, ** $p < .01$, * $p < .05$.

Table 4.

Indirect effects of need-based experiences on (de)motivating approaches via motivational quality among physical education teachers.

	β (SE)	p-value	95% CI _{BC}
Indirect effects of need satisfaction on participative approaches			
Total indirect	.254(.074)	.001	(.13, .38)
Specific indirect via autonomous motivation	.332(.109)	.002	(.15, .51)
Specific indirect via controlled motivation	-.057(.026)	.032	(-.10, -.01)
Specific indirect via amotivation	-.022(.044)	.621	(-.09, .05)
Indirect effects of need frustration on participative approaches			
Total indirect	.124(.079)	.119	(-.01, .25)
Specific indirect via autonomous motivation	.017(.050)	.728	(-.06, .10)
Specific indirect via controlled motivation	-.088(.038)	.019	(-.15, -.03)
Specific indirect via amotivation	.019(.101)	.053	(.03, .36)
Indirect effects of need satisfaction on attuning approaches			
Total indirect	.304(.088)	.001	(.16, .50)
Specific indirect via autonomous motivation	.354(.123)	.004	(.15, .56)
Specific indirect via controlled motivation	-.043(.026)	.097	(-.09, .00)
Specific indirect via amotivation	-.008(.023)	.746	(-.05, .03)
Indirect effects of need frustration on attuning approaches			
Total indirect	.019(.093)	.835	(-.13, .17)
Specific indirect via autonomous motivation	.018(.052)	.725	(-.07, .11)
Specific indirect via controlled motivation	-.066(.038)	.084	(-.13, -.00)
Specific indirect via amotivation	.068(.127)	.596	(-.14, .28)
Indirect effects of need satisfaction on guiding approaches			
Total indirect	.227(.087)	.009	(.08, .37)
Specific indirect via autonomous motivation	.278(.112)	.013	(.09, .46)

Specific indirect via controlled motivation	-.053(.025)	.033	(-.09, -.01)
Specific indirect via amotivation	.002(.013)	.890	(-.02, .02)
Indirect effects of need frustration on guiding approaches			
Total indirect	-.084(.091)	.359	(-.23, .07)
Specific indirect via autonomous motivation	.014(.041)	.727	(-.05, .08)
Specific indirect via controlled motivation	-.082(.037)	.026	(-.14, -.02)
Specific indirect via amotivation	-.016(.118)	.892	(-.21, .18)
Indirect effects of need satisfaction on clarifying approaches			
Total indirect	.283(.093)	.002	(.13, .44)
Specific indirect via autonomous motivation	.273(.120)	.023	(.08, .47)
Specific indirect via controlled motivation	.020(.026)	.447	(-.02, .06)
Specific indirect via amotivation	-.010(.023)	.665	(-.08, .03)
Indirect effects of need frustration on clarifying approaches			
Total indirect	.136(.092)	.137	(-.02, .29)
Specific indirect via autonomous motivation	.014(.041)	.727	(-.05, .08)
Specific indirect via controlled motivation	.031(.040)	.435	(-.03, .10)
Specific indirect via amotivation	.091(.114)	.422	(-.09, .28)
Indirect effects of need satisfaction on demanding approaches			
Total indirect	.137(.062)	.028	(.03, .24)
Specific indirect via autonomous motivation	.066(.070)	.344	(-.05, .18)
Specific indirect via controlled motivation	.092(.031)	.003	(.04, .014)
Specific indirect via amotivation	-.021(.039)	.587	(-.09, .04)
Indirect effects of need frustration on demanding approaches			
Total indirect	.339(.074)	<.001	(.22, .46)
Specific indirect via autonomous motivation	.003(.010)	.743	(-.01, .02)
Specific indirect via controlled motivation	.144(.040)	<.001	(.08, .21)
Specific indirect via amotivation	.191(.083)	.022	(.05, .33)
Indirect effects of need satisfaction on domineering approaches			
Total indirect	.164(.063)	.009	(.06, .27)
Specific indirect via autonomous motivation	.093(.063)	.140	(-.01, .20)
Specific indirect via controlled motivation	.100(.032)	.002	(.05, .15)
Specific indirect via amotivation	-.029(.052)	.582	(-.14, .06)
Indirect effects of need frustration on domineering approaches			
Total indirect	.416(.073)	<.001	(.30, .54)
Specific indirect via autonomous motivation	.005(.014)	.732	(.02, .03)
Specific indirect via controlled motivation	.156(.041)	<.001	(.09, .22)
Specific indirect via amotivation	.255(.082)	.002	(.12, .39)
Indirect effects of need satisfaction on abandoning approaches			
Total indirect	.062(.069)	.367	(-.05, .18)
Specific indirect via autonomous motivation	.050(.058)	.388	(-.05, .15)
Specific indirect via controlled motivation	.051(.024)	.030	(.01, .09)
Specific indirect via amotivation	-.039(.071)	.580	(-.16, .08)
Indirect effects of need frustration on abandoning approaches			
Total indirect	.434(.077)	<.001	(.31, .56)
Specific indirect via autonomous motivation	.003(.008)	.745	(-.01, .02)
Specific indirect via controlled motivation	.080(.035)	.023	(.02, .01)
Specific indirect via amotivation	.251(.093)	<.001	(.20, .50)
Indirect effects of need satisfaction on awaiting approaches			
Total indirect	.106(.084)	.206	(-.03, .25)
Specific indirect via autonomous motivation	.128(.095)	.176	(-.03, .29)
Specific indirect via controlled motivation	.027(.032)	.404	(-.03, .08)
Specific indirect via amotivation	-.048(.086)	.573	(-.19, .09)
Indirect effects of need frustration on awaiting approaches			
Total indirect	.479(.112)	<.001	(.30, .66)
Specific indirect via autonomous motivation	.007(.019)	.732	(-.03, .04)
Specific indirect via controlled motivation	.042(.050)	.403	(-.04, .12)
Specific indirect via amotivation	.431(.128)	.001	(.22, .64)

Note. CI_{BC} = 95% bias-corrected bootstrap confidence interval.

Finally, all non-significant direct effects are included in a table in Supplemental material, together with all other significant direct effects.

Discussion

Grounded in SDT, this research aimed to examine potential differences in PE teachers' (de)motivating approaches by gender, school level, and teaching experience, to explore the extent to which PE teachers' need-based experiences prospectively predict the eight (de)motivating approaches through quality of motivation. The main findings revealed that: 1) male, secondary school, and more experienced teachers scored lower on autonomy-supportive approaches, and higher on controlling and chaotic approaches; 2) PE teachers' BPNs mainly positively predicted autonomous motivation, which positively gave rise to participative, attuning, guiding, and clarifying approaches; and 3) PE teachers' BPN frustration positively explained controlled motivation and amotivation, which overall positively predicted demanding, domineering, abandoning, and awaiting approaches. These results shed new light on the role that the need-based experiences and motivational quality of PE teachers play in (de)motivating approaches, which had remained unexplored until now.

Differences in (De)Motivating Approaches According to Gender, School Level, and Teaching Experience Amongst PE Teachers

Our findings show that male teachers scored higher in demanding, domineering, and abandoning approaches, while female teachers scored higher in the participative approach. These findings were partially aligned with Vermote et al. (2020, 2023), who also showed gender differences in autonomy-supportive (i.e. participative and attuning) and chaotic (i.e. abandoning and awaiting) approaches. While there were common results in terms of male teachers being more chaotic, the results differed for autonomy-supportive approaches because male generalist teachers were more autonomy-supportive (Vermote et al., 2020, 2023), whereas, in our study, female PE teachers were more participative in lessons. Unlike previous studies (Burel et al., 2021; Escrivá-Boulley et al., 2018; Vermote et al., 2023), this is the first study that has shown gender differences in the two controlling approaches, suggesting that male PE teachers are more demanding and domineering than female PE teachers when directing students in PE lessons. The observed gender differences in PE teachers' approaches may be rooted in social experiences and accumulated cognitive biases. Even though both male and female teachers receive similar training, social interactions and experiences inside and outside of school may be associated with their teaching approach. Eccles & Roeser

(2011) argue that schools, as developmental contexts during adolescence, may be associated with gender expectations, which might be linked to variations in teachers' teaching practices. Additionally, cognitive biases, developed throughout life due to experiences and socialisation, could affect pedagogical practice. Nosek et al. (2007) found that people may act on gender stereotypes, even unconsciously. The observed variations in past research, including the studies by Vermote et al. (2020, 2023), may be attributed to the interplay of these factors.

At the school level, our analysis showed that primary school PE teachers were more inclined towards participative and attuning approaches, whereas their counterparts in secondary schools favoured more demanding, domineering, abandoning, and awaiting approaches. These results differed from those of Vermote et al. (2023), who reported that autonomy-supportive, structuring, controlling, and chaotic styles were similar, hardly differing in primary and secondary teachers. Notwithstanding this, our findings are partially in keeping with previous studies (Barkoukis et al., 2010; Digelidis & Papaioannou, 1999), which reported that primary teachers were more prone to practices that focussed on joint decision-making, cooperative learning among students, skill development and hard work, dimensions theoretically framed within autonomy-supportive and structuring approaches. These studies (Barkoukis et al., 2010; Digelidis & Papaioannou, 1999) also pointed out that secondary teachers tended towards coercive and guilt-induction strategies when guiding students in lessons, which conceptually fits in with the controlling style.

Our results also displayed that less experienced teachers scored higher in the attuning approach, while more experienced teachers scored higher in the controlling and chaotic approaches. Although our results partially contrast with Hellebaut et al. (2023) on indicating that less experienced teachers scored lower on demanding approaches, they are in line with this research insofar as more experienced teachers scored higher in the abandoning approach. This could be explained because senior teachers tend to spend less time on planning their lessons and use a variety of activities that they believe work best, including competitive activities (Hall & Smith, 2006). In contrast, junior teachers often devote considerable time to meticulously organizing their lessons, prioritizing extended practice periods where learning takes precedence over outcomes (Hall & Smith, 2006). This observation is consistent with findings from the current study, where less experienced teachers demonstrated a higher propensity for attuning approaches to navigate students through their PE lessons.

Relationships Between PE Teachers' Need-Based Experiences and Motivation With Their Own (De)Motivating Approaches

Regarding the second objective, firstly, in line with previous research with generalist and PE teachers (Abós et al., 2019; Abós, Haerens, et al., 2018), our results show a positive and very high (.54) association of PE teachers' BPNs with their autonomous motivation for teaching. Following SDT (Ryan & Deci, 2020), a plausible explanation is that BPN satisfaction primarily energises higher-quality motivation. To illustrate this, when teachers feel free to teach as desired, efficiently and integrated into the school, they tend to enjoy and personally value the teaching profession. In contrast to previous research with teachers (Abós et al., 2019; Abós, Haerens, et al., 2018), our findings revealed a positive relationship between PE teachers' BPN satisfaction and controlled motivation, although to a lesser degree (.31) than the relationship with autonomous motivation. Despite the mitigating effect of BPN satisfaction on lower-quality motivation (Ryan & Deci, 2020), our findings are in line with those of Granero-Gallegos et al. (2023), indicating that PE teachers who feel their needs for autonomy, competence, and relatedness are met at work may also feel obligated to meet specific work demands set by the school leadership and to take on undesirable teaching tasks, in pursuit of contingent self-esteem for their achievements.

Akin to previous studies with generalist teachers (Collie et al., 2016; Van den Berghe et al., 2014), our results display positive associations of PE teachers' BPN frustration with their controlled motivation and amotivation. Although the effect size of the predictions was similar, it was higher for amotivation (.55) than for controlled motivation (.48). This could be explained because when PE teachers feel coerced to teach in a prescribed manner, inept in what they do and excluded by the school leadership team, they are prone to perform their teaching work as a means to meet the demands from students, families, and the school leadership team (i.e., controlled motivation), or they exhibit passive commitment after fully losing social utility, personal value, and interest in teaching PE (i.e., amotivation). Building upon prior SDT-based research (Ryan & Deci, 2020; Vasconcellos et al., 2020), these findings underscore a significant association between BPN frustration and the lower-quality motivation among PE teachers.

Similar to previous research (Aelterman et al., 2019; Escriva-Boulley et al., 2021; Vermote et al., 2020) and following SDT (Ryan & Deci, 2020), the autonomous motivation of PE teachers was found to be positively and strongly linked to the two

autonomy-supportive approaches, namely participative (.61) and attuning (.63). Additionally, it was positively associated, albeit to a slightly lesser extent, with structuring approaches (i.e., guiding (.51) and clarifying (.51)). A potential explanation could be that when teachers put effort into their teaching, due to their curiosity, their passion for their work, and the value they assign to their task, they could provide students with the possibility of engaging in the learning process (i.e., participative approaches), showing interest in their opinions and preferences for the PE lesson (i.e., attuning approaches). Furthermore, it is probable that an autonomously motivated teacher could also be more inclined to clearly communicate learning expectations and goals to students for good classroom development (i.e., clarifying approach), providing them with indications that adapt to their skill level, as well as positive helpful feedback for task accomplishment (i.e., guiding approach).

Following previous studies based on the circumplex approach (Aelterman et al., 2019; Escriva-Boulley et al., 2021; Vermote et al., 2020) and SDT (Ryan & Deci, 2020), our results also show that PE teachers' controlled motivation, and especially amotivation, positively explained the two controlling (i.e., demanding and domineering) and chaotic (i.e., abandoning and awaiting) approaches. While it is true that controlled motivation and amotivation similarly predict demanding and domineering approaches, the difference lies particularly in the prediction of the abandoning approach, as the prediction of amotivation (.64) is far higher than that of controlled motivation (.17). Therefore, it must be considered that, although both have a strong association with a controlling style (i.e., demanding and domineering approaches), amotivation is the one that has greater prediction on a chaotic style. These findings would suggest that when PE teachers are driven by self-imposed and external pressures and chiefly by a passive commitment to teaching PE, they are mainly prone to ignore their students' opinions in favour of prioritising their own viewpoint, using both overt and behaviour-centred strategies (i.e., demanding approach), and covert and guilt-induction practices (i.e., domineering approach). Likewise, controllingly motivated and, especially, amotivated PE teachers also tend to leave students to their own devices by not intervening (i.e., abandoning approach) and take wait-and-see attitudes in the classroom (i.e., awaiting approach). Furthermore, there were values over .60 and .70 for the effect size, suggesting a potential over-similarity among variables and jeopardizing the obtained findings. However, it is important to consider that great effect sizes may be obtained when the variables under study share a similar theoretical and empirical framework

(Dominguez-Lara, 2017). This point is particularly important considering the theoretical closeness of general (de)motivating approaches, and more so for those approaches that differ significantly in their level of directiveness (high versus low) and in their orientation towards supporting versus thwarting needs. As the differences between the eight approaches become more subtle and less pronounced, there is a possibility that they overlap in how they account for the observed variance. This means that, despite being distinct, the approaches might share underlying factors that explain the behaviour or outcomes being studied.

Interestingly, this research has also revealed negative cross-paths from controlled motivation to participative and guiding approaches. These findings contrast with previous studies (Aelterman et al., 2019; Escriva-Boulley et al., 2018), which found the relationships between the variables in question to be non-significant. However, our findings are partially consistent with the studies by Abós, Haerens, et al. (2018) and Vermote et al. (2020), indicating that controlled motivation generally shows a negative correlation with an autonomy-supportive style and, more specifically, with a participative approach. This implies that PE teachers, driven by internal and external pressures to conduct PE classes, might be less likely to offer students opportunities to choose certain aspects of learning (i.e. participative approach) and may also refrain from providing direction and feedback (i.e. guiding approach) during PE lessons.

Therefore, it is tenable that the use of need-supportive or need-thwarting approaches by PE teachers is influenced by their controlled motivation. Akin to Escriva-Boulley et al. (2021), controlled-motivated teachers tended not only to adopt need-thwarting styles, but also to avoid need-supportive styles. In a relatively similar way, Vermote et al. (2020) reported that teachers' controlled motivation was negatively associated with their need-supportive styles. This dual pathway sheds light on both previous and current scientific evidence, highlighting that the origin of controlled motivation in PE teachers (i.e., BPN satisfaction or BPN frustration) is associated with their classroom performance in distinct ways (i.e., need supportive and need thwarting teaching approaches).

Limitations and Future Research Avenues

Firstly, the present research relied on self-reports, which, despite being the standard measures of (de)motivating teaching approaches, leave room for exploration of alternative instruments in future studies. Such tools could include interviews, observations by external evaluators, and analysis of students' perceptions regarding

their teacher's (de)motivating approaches to enhance data triangulation. Secondly, this research took a cross-sectional design, making it impossible to establish causal relationships between the target variables. Longitudinal studies could shed more light on the reciprocal associations between PE teachers' need-based experiences and motivation, and their own (de)motivating approaches over time. Thirdly, and akin to previous SIS-based research with teachers (Aelterman et al., 2019; Burgueño, Abós, et al., 2024; Escriva-Boulley et al., 2021), low reliability scores were obtained in various (de)motivating approaches in the sample of PE teachers. These results should therefore be treated with caution. Fourthly, only the motivational process of PE teachers and their behaviours during classes were considered, without accounting for certain social and/or motivational antecedents that can determine this process. Therefore, for future studies, it would be advisable to consider some of these antecedents (e.g., pressure from above (school leaders), within (teachers themselves), and below (students)). In addition, although relatedness-supportive and relatedness-thwarting styles are part of the variety of (de)motivating styles to be used by teachers in the PE lesson, they do not fit well into the two axes of teachers' need-supportiveness and directiveness and, therefore, both were not included in the circumplex approach to (de)motivating styles proposed by Aelterman et al. (2019). Another potential limitation could have been the use of item parceling. Although some shortcomings could be emerged from the use of item parcels (e.g., item one-dimensionality within each item parcel), they also offer advantages in terms of reduced bias, improved parsimony, and model satiability (see Kline, 2010). Our study, indeed, gathered evidence for the trustworthiness of the item dimensionality via CFAs with individual items for the measures of (de)motivating approaches, need-based experiences, and quality of motivation. In addition to these psychometric advantages and consistent with Haerens et al. (2015), the approach followed in the study demonstrates the usefulness and effectiveness of item parcels in educational research in general, and in examining structural relationships between variables in particular.

Conclusions

The present research, adopting an SDT-based circumplex perspective, illuminates the connections between PE teachers' personal traits and motivational mechanisms and their adoption of a variety of (de)motivating approaches for optimal PE classroom management. Our results show that male, secondary school, and more experienced PE teachers scored lower on the two autonomy-supportive approaches, and higher on controlling and chaotic approaches. These results demonstrate the importance

of considering the individual characteristics of each PE teacher in future professional development programmes, as these can be associated their motivational process and behaviour during the lessons. Moreover, our findings suggest that PE teachers' need-based experiences and motivational quality are associated with the use of a combination of (de)motivating approaches in PE lessons. Specifically, PE teachers' BPN satisfaction primarily promotes their autonomous reasons for teaching and, in turn, autonomy-supportive and structuring approaches to guiding students in the classroom. Conversely, PE teachers' BPN frustration primarily favours both controlled reasons and amotivation for teaching and, consequently, controlling and chaotic approaches to directing students in lessons. Taken as a whole, this research lays the first foundations for developing continuous PE teacher education programmes which, drawing from their personal traits, aim to help PE teachers both favour their BPN satisfaction and autonomous motivation, and engage with a variety of motivating approaches for optimal classroom management. A complementary goal would be to help PE teachers minimise their experiences of BPN frustration, controlled motivation and amotivation, and avoid a mainly demotivating teaching profile as much as possible in PE lessons.

Supplemental material

Table SM1.

Mean differences by gender and school level in need-based experiences and motivation.

	Female	Male				Primary	Secondary			
	<i>M(SD)</i>	<i>M(SD)</i>	F	<i>p-value</i>	η^2_p	<i>M(SD)</i>	<i>M(SD)</i>	F	<i>p-value</i>	η^2_p
Need-based experiences										
Need satisfaction	4.43(0.40)	4.42(0.43)	0.03	.834	<.01	4.41(0.43)	4.45(0.41)	1.59	.208	<.01
Need frustration	1.77(0.50)	1.79(0.50)	0.23	.632	<.01	1.77(0.52)	1.79(0.48)	0.12	.729	<.01
Motivational quality for teaching										
Autonomous motivation	4.70(0.42)	4.64(0.45)	2.52	.113	<.01	4.71(0.42)	4.59(0.45)	13.02	<.001	.02
Controlled motivation	2.38(0.77)	2.59(0.77)	12.03	.001	.02	2.47(0.75)	2.58(0.81)	3.49	.062	.01
Amotivation	1.10(0.27)	1.13(0.37)	0.65	.421	<.01	1.09(0.31)	1.16(0.37)	6.93	.009	.01

Note. Significantly different groups are shown by different letters in superscript.

Table SM2.

Mean differences by teaching experience in need-based experiences and motivation.

	0-9	10-19	20-29	+29			
	<i>M(SD)</i>	<i>M(SD)</i>	<i>M(SD)</i>	<i>M(SD)</i>	F	<i>p</i>	η^2_p
Need-based experiences							
Need satisfaction	4.41(0.43)	4.45(0.38)	4.43(0.44)	4.43(0.59)	0.38	.766	<.01
Need frustration	1.80(0.52)	1.72(0.45)	1.78(0.52)	1.91(0.55)	1.77	.152	.01
Motivational quality for teaching							
Autonomous motivation	4.72(0.38) ^a	4.67(0.37) ^a	4.49(0.58) ^b	4.43(0.73) ^b	9.32	<.001	.04
Controlled motivation	2.57(0.79)	2.46(0.74)	2.46(0.76)	2.46(0.83)	1.05	.369	.01
Amotivation	1.09(0.25) ^a	1.10(0.27) ^a	1.22(0.55) ^b	1.31(0.69) ^b	6.39	<.001	.03

Note. Letters in superscript show significantly different groups (Bonferroni's correction at $p < .0125$)

Table SM3.*Direct effects of target variables*

	β (SE)	<i>p</i> -value	95% CI _{BC}
Direct effects on participative approach			
Autonomous motivation	.614(.170)	<.001	(.33, .89)
Controlled motivation	-.185(.071)	.009	(-.33, -.07)
Amotivation	.352(.191)	.065	(.04, .67)
Direct effects on attuning approach			
Autonomous motivation	.656(.192)	.001	(.34, .97)
Controlled motivation	-.140(.074)	.059	(-.26, -.02)
Amotivation	.122(.238)	.607	(-.27, .51)
Direct effects on guiding approach			
Autonomous motivation	.514(.175)	.003	(.23, .80)
Controlled motivation	-.172(.071)	.015	(-.29, .06)
Amotivation	-.029(.213)	.891	(-.38, .32)
Direct effects on clarifying approach			
Autonomous motivation	.505(.193)	.009	(.18, .82)
Controlled motivation	.065(.082)	.432	(-.07, .20)
Amotivation	.165(.206)	.423	(-.17, .50)
Direct effects on demanding approach			
Autonomous motivation	.122(.126)	.332	(-.09, .33)
Controlled motivation	.303(.064)	<.001	(.20, .41)
Amotivation	.345(.141)	.014	(.11, .58)
Direct effects on domineering approach			
Autonomous motivation	.172(.113)	.128	(-.14, .36)
Controlled motivation	.327(.064)	<.001	(.22, .43)
Amotivation	.462(.131)	<.001	(.25, .68)
Direct effects on abandoning approach			
Autonomous motivation	.092(.107)	.389	(-.08, .27)
Controlled motivation	.168(.067)	.012	(-.08, .28)
Amotivation	.635(.155)	<.001	(.38, .89)
Direct effects on awaiting approach			
Autonomous motivation	.237(.172)	.167	(-.05, .52)
Controlled motivation	.087(.102)	.391	(-.08, .26)
Amotivation	.779(.182)	<.001	(.48, 1.08)
Direct effects on autonomous motivation			
Need satisfaction	.541(.071)	<.001	(.42, .66)
Need frustration	.028(.083)	.736	(-.11, .17)
Direct effects on controlled motivation			
Need satisfaction	.305(.073)	<.001	(.19, .43)
Need frustration	.476(.075)	<.001	(.35, .70)
Direct effects on amotivation			
Need satisfaction	-.062(.108)	.567	(-.24, .12)
Need frustration	.553(.092)	<.001	(.40, .70)

Note. CI_{BC} = 95% bias-corrected bootstrap confidence interval.

4.2. Estudio 2: Does It Matter Whether Physical Education Teachers Combine Structure With Autonomy Support Rather Than Control? Differences in Motivation for Teaching and Work-Related Outcomes

Situación actual: Sometido. Segunda ronda de revisión por pares.

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Abstract

Background: The circumplex model of (de)motivating teaching sustains that physical education (PE) teachers may combine the provision of structure in their lessons, with autonomy support and/or control, as structure is positioned in between. However, how these three teaching styles are combined has not been empirically examined via a person-centered approach so far.

Purpose: This study aims, therefore, to identify (de)motivating teaching profiles using structuring, autonomy-supportive, and controlling approaches, and to examine which profile is more (mal)adaptive in terms of teachers' motivation to teach, job satisfaction, and professional performance.

Method: In a sample of 640 PE teachers ($M_{age} = 36.70 \pm 7.87$; 63% male), four profiles were identified: 1 = "highly structuring - highly autonomy-supportive - lowly controlling", 2 = "highly structuring - highly autonomy-supportive - highly controlling", 3 = "moderately structuring - moderately autonomy-supportive - lowly controlling", and 4 = "moderately structuring - lowly autonomy-supportive - moderately controlling".

Results: Results showed that PE teachers providing structure in combination with predominantly autonomy-supportive teaching (i.e., profile 1), in general, reported the most adaptive pattern of motivation to teach and, consequently, achieved better work-related outcomes. The opposite was true for PE teachers who provide structure in combination with controlling teaching (i.e., profile 4). Between profiles 2 and 3, differences were less clear, except for controlled motivation, which was higher in profile 2, characterised by high levels of control.

Conclusions: Thus, it seems important to have high-quality motivation toward teaching, as it is highly related to need-supportive teaching styles, and ultimately, to better psychological functioning. Likewise, findings also point toward the risks of providing control, especially in its predominant format, but also, yet to a lesser extent, when combined with needs support.

Keywords:

Circumplex approach, teaching behaviors, teaching motivation, job-related outcomes.

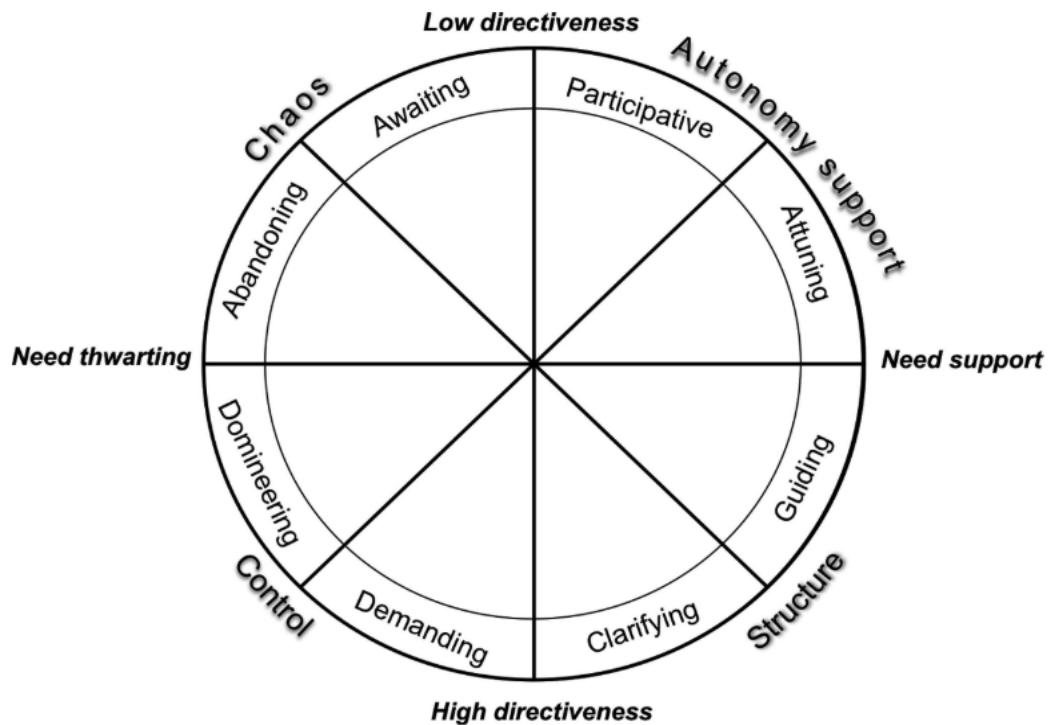
Introduction

Building upon self-determination theory (SDT; Ryan & Deci, 2017), the teacher's provision of structure is especially relevant to guide students' learning and managing the physical education (PE) classroom (Patall et al., 2023). Nevertheless, the teacher-provided structure, by itself, might or might not yield the expected benefits for students (Cheon et al., 2020). This is because the positive effects of structure on promoting students' motivational process and engagement are more significant when structure is combined with autonomy support (e.g., with attuning and participative practices, and a supportive tone of voice) rather than when it is combined with control (e.g., with demanding and domineering practices, and a pressuring tone of voice) (Cheon et al., 2020). The combination of structure and autonomy support is expected not only to yield the greatest benefits for students but also to benefit teachers themselves in terms of their motivation to teach, teaching efficacy, and job satisfaction (Cheon et al., 2020).

Aelterman et al. (2019) and Escriva-Boulley et al. (2021) theorize an SDT-based circumplex approach that introduces the teacher's styles of autonomy support, structure, control, and chaos into a circular structure based on need-supportiveness (i.e., *x*-axis; the extent to which the teacher supports or thwarts the students' needs) and directiveness (i.e., *y*-axis; the extent to which the teacher takes the lead in learning interactions or transfers it to students themselves). This gradual approach of the circumplex model of motivating and demotivating teaching (Aelterman et al., 2019) positions structure in between autonomy support and control. SDT-based research suggests that structure may be optimally combined with autonomy support whereas the challenge is to avoid synergically using it with control falling into a demotivating rigidity. While the SDT-based examination of the relationships between teachers' styles of structure, autonomy support, and control with students' outcomes in PE lessons has mainly relied on students' perceptions, no evidence was found to date on PE teachers' perceptions of combinations of their own structure, autonomy support, and control. Guided by the SDT-based circumplex approach, the present person-centered study seeks to examine the extent to which PE teachers perceive themselves as combining a structuring style with either autonomy-supportive and controlling approaches, and how the resulting combinations may differ in their motivation for teaching, job satisfaction, and professional performance.

Figure 1.

Circumplex approach to (de)motivating styles and approaches in PE.



Note. Graphical representation taken from Aelterman et al. (2019).

PE Teachers' Structure, Autonomy Support, and Control from a Circumplex Approach

The circumplex approach conceptualizes PE teacher's styles of autonomy support, structure, control, and chaos according to the degree in which they are need-supportive, relative to need-thwarting, in nature and high, relative to low, in directiveness (i.e., integrative vision). In addition, each style is operationalised into two more specific teaching approaches (i.e., refined vision) (Aelterman et al., 2019; Burgueño, Abós, et al., 2024; Escriva-Boulley et al., 2021). Under the circumplex lens, structure and autonomy support are common in their need-supportive nature, yet quantitatively different as one is highly directive (i.e., structure) and another is low directive (i.e., autonomy support). Likewise, structure and control are both high in directiveness, but qualitatively distinct as the first is need-supportive and the second is need-thwarting. Structure involves PE teachers taking an interpersonal tone of guidance focused on progress and process making students steadily develop their skills. When structuring, a PE teacher provides their students with step-by-step directions, skill-building feedback, and encouragement for successful activity accomplishment (i.e., guiding approach), as well as (s)he communicates clear goals and expectations, well-suited activity

difficulty as needed, and consistently monitors the students' progress (i.e., clarifying approach).

Structure (especially the guiding approach) is situated adjacent to autonomy support within the circumplex model. Autonomy support refers to PE teachers displaying an interpersonal tone of understanding and flexibility toward students' preferences. When PE teachers rely on an autonomy-supportive style, they can use participative approaches (i.e., providing students with opportunities for choice and voice through dialog) and attuning approaches (i.e., encouraging students to figure out their interests and promoting the relevance of activity engagement). Moreover, structure (especially the clarifying approach) is also adjacent to control within the circumplex approach. Control refers to PE teachers showing an interpersonal tone of pressure for students to behave, feel, and think in prescribed ways. When PE teachers engage in a controlling style, they can use demanding (i.e., behavior-focused strategies) and domineering (i.e., power-assertive strategies) approaches.

A structuring style can be combined with an autonomy-supportive style to the benefit of the students (Cheon et al., 2020). Thus, the PE teacher provides students with guiding (e.g., helpful instructions, skill-building feedback) and clarifying (e.g., clear goals and assessment criteria) approaches in an autonomy-supportive manner since the teacher dialogues with students (i.e., participative approach), in the same way as (s)he meaningfully argues with them and uses an invitational language (i.e., attuning approach). Simultaneously, the circumplex model suggests that structure can easily turn into control depending on how directions are provided (Aelterman et al., 2019). For instance, the PE teacher can provide students with guiding elements (e.g., useful directions and learning-oriented feedback) and clarifying elements (e.g., clear expectations) in controlling ways such that (s)he imposes them on students with overtly powerful commands (i.e., demanding approach) and threats, accompanied by personal attacks (i.e., domineering approach) (Cheon et al., 2020).

How Teaching Styles (and Their Combinations) Are Associated with Teachers' Motivation and Job-Related Outcomes

SDT-based research postulates that one key determinant of the PE teachers' provision of structure, and whether it is provided in an autonomy-supportive rather than controlling way is the quality of teachers' own motivation (Abós, Haerens et al., 2018; Hellebaut et al., 2023; Vermote et al., 2020). Central to SDT is the distinction between autonomous motivation, controlled motivation, and amotivation which are situated along a self-determination continuum (Ryan & Deci, 2017). Autonomous motivation stands at one end of the continuum, involving PE teachers who enjoy teaching and spend as much time as possible

to prepare their lessons (i.e. intrinsic motivation), as well as considering teaching as an important profession (i.e. identified regulation). In the center of the continuum, there is controlled motivation involving PE teachers who consider teaching as a means to boost self-esteem and avoid guilt and shame at work (i.e. introjected regulation) and to meet demands from the school leadership team and educational administrators (i.e. external regulation). At the opposite end of the continuum, we find amotivation, involving a lack of motivation, which is a characteristic of PE teachers who believe that teaching is a futile profession, and therefore, do not strive (Abós, Haerens et al., 2018).

Focusing on the SDT-based circumplex approach, previous research reported that PE teachers' autonomous motivation was positively associated with autonomy-supportive and structuring styles, and controlled motivation and amotivation were positively associated with controlling style (Slemp et al., 2020). Nonetheless, the relationships could be cross inasmuch as Escrivá-Boulley et al. (2021) did not find relationships between controlled motivation and autonomy-supportive and structuring approaches, whereas Vermote et al. (2020) revealed negative associations of teachers' controlled motivation with autonomy-supportive and guiding approaches.

Further, a growing basis of SDT-grounded research has documented that the degree to which PE teachers provide structure in autonomy-supportive rather than controlling ways is associated with their well-being at work. Teachers' job satisfaction refers to enjoyment and contentment resulting from the appreciation of their job (Locke, 1976). In addition, professional performance concerns the belief that PE teachers shape regarding their own ability to plan, organize, and deliver PE lessons (Lee & Ko, 2010). Indeed, previous research has reported positive correlations between PE teachers' styles of autonomy support and structure with their job satisfaction and performance, while negative correlations were found between PE teachers' controlling style and their job satisfaction and performance (e.g., Cheon et al., 2020).

Each of these previous variable-centered studies made a valuable contribution; however, they only provided an overall snapshot of the average associations of PE teachers' styles of structure, autonomy support, and control with different outcomes. To overcome this, person-centered approaches are helpful in detecting groups of PE teachers who share specific characteristics or relations among attributes (i.e., perception of structure, autonomy-support, and control) and, thus, enable us to analyze how PE teachers combine structure, autonomy support, and control and how these combinations differ in teachers' motivation to teach, their job satisfaction, as well as their professional performance.

Combining the Provision of Structure With Autonomy Support or Control

To the best of our knowledge, much of the previous SDT-based person-centered research examining the associations of the teachers' styles of structure, autonomy support, and control with outcomes in PE mainly relied on students' perceptions. According to students' self-reports, PE teachers combined different need-supportive and need-thwarting styles at varying degrees in PE lessons (Burgueño, García-González, et al., 2024; García-González et al., 2023; Haerens et al., 2018). While Burgueño, García-González, et al. (2024) focused on general combinations of need-supportive and need-thwarting styles from PE teachers, Haerens et al. (2018) put the spotlight on configurations of autonomy support and control, and García-González et al. (2023) analysed combinations of structure (or competence-support) and control. Notwithstanding discrepancies in studying the PE teachers' styles in the eyes of students, the three studies identified four teaching profiles. Two of the four profiles could be common with one being characterised by the dominant presence of need-supportive styles generally or autonomy support and structure particularly, and another being characterised by the predominant presence of need-thwarting styles in general or control in particular (Burgueño, García-González, et al., 2024; García-González et al., 2023; Haerens et al., 2018). The remaining profiles differed in nature across the three studies with low-to-high perceptions both of need-supportive (or autonomy-supportive/structuring) styles and of need-thwarting (or controlling) styles. Similarly, the three previous person-centered studies all showed that profiles characterised by high perceived need-supportive (or autonomy-supportive/structuring) styles obtained the most optimal pattern of students' outcomes, while the opposite was true for profiles with high need-thwarting (or controlling) styles. The results further reported that moderate perceptions of need-thwarting (or controlling) styles were detrimental to students' outcomes, even in the presence of moderate-to-high perceptions of need-supportive (or autonomy-supportive/structuring) styles.

With a specific focus on the teacher's provision of structure in combination with either an autonomy-supportive or controlling style, a qualitative study by Wallace et al. (2014) indicated that structure produced motivational benefits in students when it was combined with autonomy-support, while if structure was combined with control, it was not so adaptive, or even become detrimental. Although previous SDT-grounded studies meaningfully contributed to understanding how teaching styles could be combined and associated with learning-related outcomes in the eyes of students; little is currently known about how teachers perceive themselves with regard to the provision of structure and whether it is combined with either a more autonomy-supportive or controlling style and how these

combinations may be related to the quality of their motivation for teaching, job satisfaction, and performance.

The Present Study

Guided by the SDT-based circumplex approach of (de)motivating styles, the current research had a two-fold objective. The first objective was to identify combinations of self-perceived structuring, autonomy-supportive, and controlling approaches used by PE teachers in their lessons. Although little evidence was found in PE teachers, previous person-centered and qualitative studies in samples of PE students (Burgueño, García-González, et al., 2024; García-González et al., 2023; Haerens et al., 2018; Wallace et al., 2014), in which they analysed students' perception of their teachers' performance in PE classes, make us hypothesize that, at least, four profiles with varying levels of structuring, autonomy-supportive, and controlling approaches will be identified. We expect to find a profile where high structure is combined with high autonomy support and low control (e.g., highly structuring and autonomy-supportive/ lowly controlling), and another profile in which relatively low structure is combined with low autonomy support and high control (e.g., lowly structuring and autonomy-supportive/highly controlling). It is tenable to hypothesize two additional profiles where structure is combined with autonomy support and control at similar high or moderate degrees (e.g., highly structuring, autonomy-supportive, and controlling structure; or moderately structuring, autonomy-supportive, and controlling).

The second objective is to examine differences in motivation for teaching, job satisfaction, and professional performance across the previously identified profiles. According to SDT-based research with teachers (e.g., Abós, Haerens et al., 2018; Burgueño, Abós et al., 2024; Vermote et al., 2020) and students (e.g., Burgueño, García-González, et al., 2024; García-González et al., 2023; Haerens et al., 2018), we hypothesize that the retained diverse profiles would differ in quality of motivation, job satisfaction, and professional performance with the “highly structuring and autonomy-supportive/lowly controlling” profile being the most adaptive in motivational and work-related outcomes and the “lowly structuring and autonomy-supportive/highly controlling” profile being the most maladaptive. We also expected to find that combinations of structure with higher autonomy support than control would be more adaptive (in terms of quality of motivation and work-related outcomes) than those with greater control than autonomy support.

Method

Participants and Procedures

A purposive sample of 640 Spanish PE teachers ($M_{age}= 36.70$; $SD= 7.87$; 63% male), with an average of 10.61 ($SD=8.25$) years of teaching experience, participated in this cross-sectional research. A total of 357 teachers worked in primary schools, while 283 worked in secondary schools with a classroom size of between 22 and 30 students. In Spain, primary PE teachers teach 25 hours/week, whereas secondary teachers teach between 18 and 24 hours/week. The majority (79.8%) of teachers are working in the public education system.

For data collection, an online questionnaire developed in Google Forms was disseminated via different PE-related institutions and social networks (i.e., WhatsApp, Facebook, and Twitter) with 30-day availability. At the beginning of the questionnaire, information was detailed indicating voluntary and anonymous participation, the absence of right or wrong responses with blank unallowed responses, as well as no compensation for participation. The questionnaire administration was approximately 20 minutes. The study was approved by the Ethics Committee of [masked for review process].

Instruments

PE Teachers' Structure, Autonomy Support, and Control. Teachers' perceptions of structuring, autonomy-supportive, and controlling approaches were measured using the Spanish version (Burgueño, Abós, et al., 2024) of the Situations-in-School Questionnaire in Physical Education (Escriva-Boulley et al., 2021). Structure is operationalised by guiding (seven items, e.g., "You give students positive feedback while offering help and guidance when necessary") and clarifying (five items, e.g., "You implement an easy-to-follow and clear organization") approaches. Autonomy support is operationalised by participative (four items, e.g., "You invite students to suggest a set of norms or rules") and attuning (eight items, e.g., "You offer enjoyable, interesting, and highly attractive tasks") approaches. Control is operationalised by demanding (seven items, e.g., "You plan a session for all students to follow. No exceptions or excuses") and domineering (five items, e.g., "You insist that students must get over it and act more maturely") approaches. Items are rated on a Likert-type scale from 1 (It does not describe me at all) to 7 (It describes me perfectly). In the current study, Cronbach's alphas were .52, .64, .65, .50, .64, and .72 for participative, attuning, guiding, clarifying, demanding, and domineering, respectively. Furthermore, the six-factor (one for each approach) exploratory structural equation modeling presented acceptable fit-indexes: $\chi^2(df=342)=624.254$, $p<.001$; $\chi^2/df=1.83$; CFI=.95; TLI=.91; SRMR=.021; RMSEA=.036(90%CI=.031-.040).

Motivation for Teaching. Teachers' motivation to teach was measured using the Spanish version of the Motivation for Teaching in Secondary Education (Abós, Sevil-Serrano et al., 2018). Following the stem "I am motivated for teaching because...", this scale includes 19 items measuring intrinsic motivation (four items, e.g., "Because I enjoy teaching"), identified regulation (four items, e.g., "Because teaching is an important personal choice for me"), introjected regulation (four items, e.g., "Because I want to be considered a good teacher by others and by myself"), extrinsic regulation (four items, e.g., "Because otherwise my bosses and the administration will punish me"), and amotivation (three items, e.g., "Because teaching has no relevance for me"). Items are rated on a Likert-type scale from 1 (strongly disagree) to 5 (strongly agree). In the current study, Cronbach's alphas were .80, .70, .65, .66, and .53 for intrinsic, identified, introjected, external, and amotivation. Furthermore, the five-factor correlated model presented acceptable fit-indexes: $\chi^2(df=135)=326.750$, $p=.204$, $\chi^2/df=2.42$; CFI=.92; TLI=.90; SRMR=.057; RMSEA=.047(90%CI=.041-.054).

Job Satisfaction. Teachers' job satisfaction was measured using the following question: "How satisfied or dissatisfied are you with your job as a PE teacher?", consistent with prior research (e.g., Cheon et al., 2014). Responses were rated on a 10-point Likert-type scale, ranging from 1 (Totally dissatisfied) to 10 (Totally satisfied).

Professional performance. Teachers' professional performance was measured using the following sentence: "Rate your satisfaction with your professional performance this academic year", consistent with previous research (e.g., Barrick et al., 2002). Responses were rated on a Likert-type scale from 1 (Non-existent) to 9 (Excellent).

Data Analysis

Descriptive statistics, latent correlations, and McDonald's omega reliability coefficient were calculated for all study variables. Although there is a widespread agreement on .70 as cut-off point for an acceptable reliability level, a growing body of research suggests the need to interpret reliability as a grayscale such that scores between .90 and .95 are interpreted as excellent reliability levels, scores .80 and above as good, scores .70 and above as acceptable, scores .60 and above as reasonable, scores .50 and above as fair, and scores below .50 as unacceptable (George & Mallery 2003; Hernaez, 2015). Latent profile analyses (LPA) were performed to identify teaching profiles based on Z-scores from guiding, clarifying, attuning, participative, demanding, and domineering approaches. LPA models were estimated using the robust maximum-likelihood (MLR) estimator, 5000 random start values, 1000 iterations, and 200 final optimizations (Muthén & Muthén, 1997-2018). The

teachers' school level was introduced as a covariate in LPA models. Starting with a two-profile model, additional profiles were iteratively added up to $k=6$. To obtain the most appropriate model, the following criteria were followed: a) Akaike Information Criterion (AIC), Bayesian Information Criterion (BIC), Sample-Sized Adjusted Bayesian Information Criterion (SSA-BIC), suggesting that lower values express a better model fit; b) the Bootstrap Likelihood Ratio (BLR) test, indicating that a significant p -value reflects that the target solution fits better than the solution with a fewer profile; c) Entropy takes values over .70 as indicative of a satisfactory classification precision; and d) a profile size of, at least, 5% of the participants is required to avoid any potential over-extraction (Weller et al., 2020). Complementary to statistical criteria, interpretability, and theoretical meaningfulness were considered. To examine differences in the quality of motivation, job satisfaction, and professional performance across the retained profiles, the Bolck-Croon-Hagenaars (BCH) method was used. Data analyses were run using SPSS v.29 and Mplus v.8.4 (Muthén & Muthén, 1997-2018).

Results

Descriptive Statistics, Reliability Coefficients, and Correlations Among Variables

Means, standard deviations, and latent correlations for the study variables are reported in Table 1. PE teachers present higher average scores than the mid-point scale for structuring and autonomy-supportive approaches, intrinsic motivation, identified and introjected regulation, job satisfaction, and professional performance. Moreover, structuring and autonomy-supportive approaches were positively correlated with intrinsic motivation, identified regulation, job satisfaction, and professional performance, while controlling approaches were positively correlated with introjected regulation, external regulation, and amotivation.

Identification and Interpretation of Profiles Based on Structuring, Autonomy-Supportive, and Controlling Approaches

Table 2 shows that the 4-profile and 5-profile solutions could be considered as optimal. Both solutions scored lower than the 2-profile and 3-profile models in AIC, BIC, and SSA-BIC, and did not significantly differ from the 6-profile model. When comparing the 4-profile with the 5-profile solutions, the additional profile was relatively similar to the profiles previously identified in the 4-profile solution and did not produce meaningful new insights concerning qualitative differences among profiles. Accordingly, when the theoretical considerations and fit-indices were deemed together, the 4-profile model had the best fit for the PE teacher sample.

The 4-profile solution is shown in Figure 2 and Table 3. Profile 1 ($n=123$, 19.22%) was labelled as “highly structuring - highly autonomy-supportive - lowly controlling” and included teachers reporting above-average scores of guiding and clarifying approaches in conjunction with above-average scores of participative and attuning approaches and below-average scores on demanding and domineering approaches. Profile 2 ($n=139$, 21.71%) was labelled as “highly structuring - highly autonomy-supportive - highly controlling” as it consisted of teachers with above-average scores both all approaches. Profile 3 ($n=246$; 38.44%) was labelled as “moderately structuring - moderately autonomy-supportive - lowly controlling” and included teachers with slightly below-average scores on guiding and clarifying approaches along with below-average scores for participative and attuning approaches and very below-average scores of demanding and domineering approaches. Finally, profile 4 ($n=132$, 20.63%) was labelled as “moderately structuring - lowly autonomy-supportive - moderately controlling” and consisted of teachers with below-average scores of guiding and clarifying approaches combined with below-average scores of participative and attuning approaches and slightly above-average scores on demanding and domineering approaches.

Table 1.

Descriptive statistics, reliability coefficients, and latent correlations between the study variables.

Variables	<i>M(SD)</i>	Range	ω	1	2	3	4	5	6	7	8	9	10	11	12	13
(De)motivating teaching approaches																
1. Participative	5.04(0.98)	1-7	.52	-												
2. Attuning	5.83(0.64)	1-7	.64	.47***	-											
3. Guiding	6.07(0.56)	1-7	.65	.29***	.56***	-										
4. Clarifying	5.59(0.83)	1-7	.50	.20***	.35***	.30***	-									
5. Demanding	3.22(1.04)	1-7	.64	-.19***	-.12**	-.09*	.24***	-								
6. Domineering	2.46(1.06)	1-7	.72	-.19***	-.17***	-.17***	.21***	.75***	-							
Motivation to teach																
7. Intrinsic	4.69(0.46)	1-5	.80	.19***	.32***	.27***	.11**	-.13**	-.13***	-						
8. Identified	4.65(0.48)	1-5	.70	.18***	.36***	.29***	.19***	-.06	-.05	.56***	-					
9. Introjected	3.04(0.99)	1-5	.65	-.10**	.02	-.04	.06	.27***	.27***	.03	.12**	-				
10. External	2.00(0.76)	1-5	.66	-.09*	-.11**	-.14***	.10**	.33***	.38***	.05	-.02	.54***	-			
11. Amotivation	1.11(0.32)	1-5	.53	-.07	-.17***	-.18***	-.07*	.17***	.20***	-.35***	-.32***	.07	.19***	-		
Work-related outcomes																
12. Job satisfaction	8.21(1.24)	1-10	-	.10*	.26***	.24***	.06	-.05	-.04	.25***	.25***	.01	-.08*	-.11**	-	
13. Professional performance	7.38(1.18)	1-9	-	.14**	.24***	.16**	.04	-.04	-.08*	.22***	.19***	-.02	-.06	-.12**	.43***	-

* $p < .05$ level; ** $p < .01$; *** $p < .001$

Table 2. *Fit indexes for latent profile models.*

Model	AIC	BIC	SSA-BIC	BLRT(p)	Entropy	Participants for profile	Np<5%
2 profiles	10461.14	10550.37	10486.87	<.001	0.751	387; 253	0
3 profiles	10197.45	10322.37	10233.47	.006	0.776	160; 338; 142	0
4 profiles	10038.32	10198.94	10084.64	.041	0.747	123; 139; 246; 132	0
5 profiles	9910.79	10107.10	9967.40	.002	0.784	128; 210; 87; 143; 72	0
6 profiles	9846.79	10078.79	9913.69	.402	0.788	53; 118; 182; 145; 91; 51	0

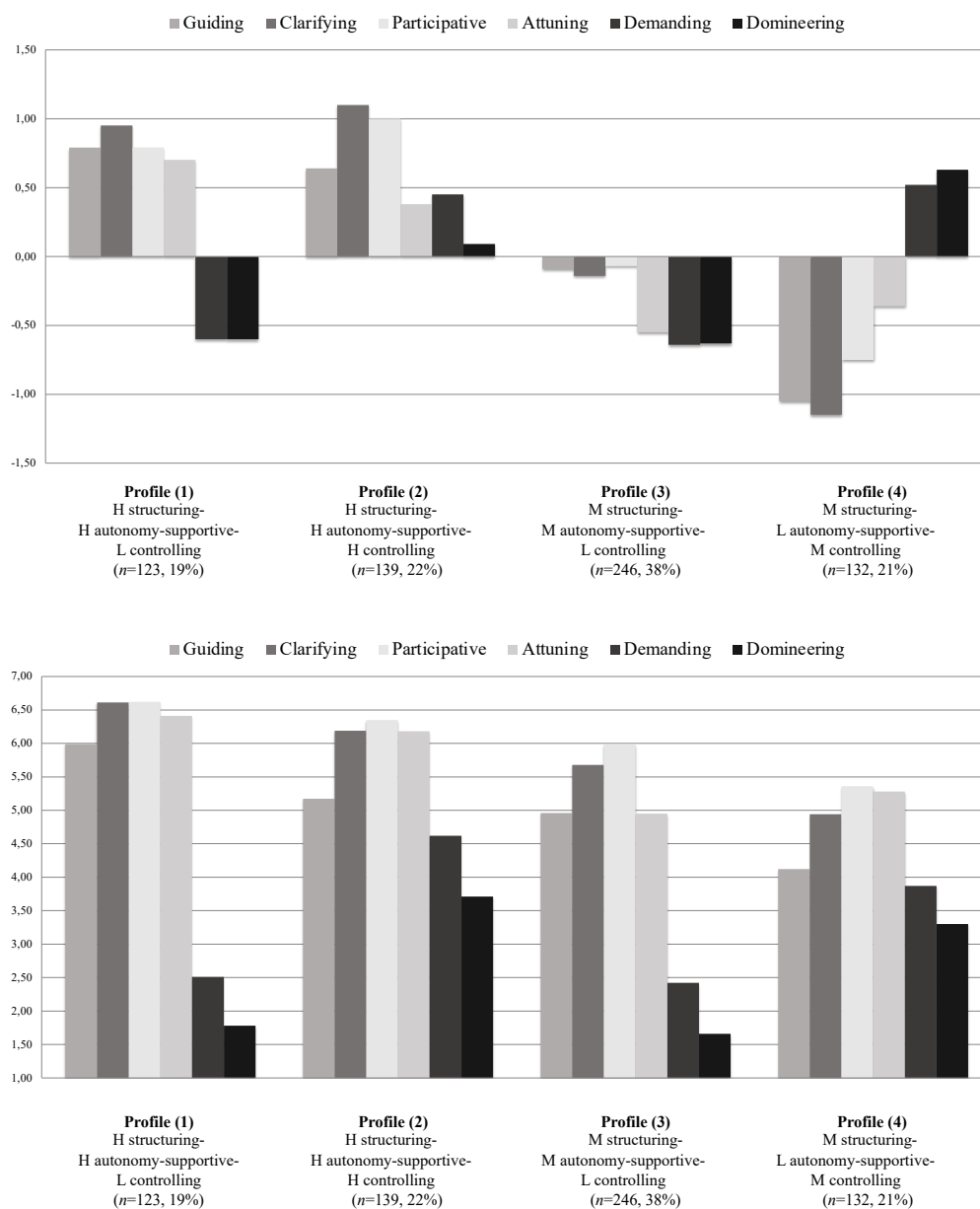
Table 3.*Mean differences in PE teachers' motivation, and work-related outcomes across the four retained profiles.*

	Profile 1: H structuring- H autonomy- supportive- L controlling (n=123)	Profile 2: H structuring- H autonomy- supportive- H controlling (n=139)	Profile 3: M structuring- M autonomy- supportive- L controlling (n=246)	Profile 4: M structuring- L autonomy- supportive- M controlling (n=132)
(De)motivating approaches				
Guiding				
Raw scores (1-7)	6.62(0.04) ^{2a,3a,4a}	6.35(0.04) ^{1a,3a,4a}	5.99(0.03) ^{1a,2a,4a}	5.36(0.05) ^{1a,2a,3a}
Z-scores	0.79(0.13) ^{2a,3a,4a}	0.64(0.14) ^{1a,3a,4a}	-0.09(0.08) ^{1a,2a,4a}	1.05(0.13) ^{1a,2a,3a}
Clarifying				
Raw scores (1-7)	6.41(0.07) ^{2c,3a,4a}	6.18(0.06) ^{1c,3a,4a}	4.95(0.06) ^{1a,2a,4a}	5.28(0.07) ^{1a,2a,3a}
Z-scores	0.73(0.11) ^{2c,3a,4a}	0.38(0.08) ^{1c,3a,4a}	-0.55(0.13) ^{1a,2a,4a}	-0.36(0.10) ^{1a,2a,3a}
Participative				
Raw scores (1-7)	5.99(0.08) ^{2a,3a,4a}	5.17(0.09) ^{1a,4a}	4.96(0.07) ^{1a,4a}	4.12(0.09) ^{1a,2a,3a}
Z-scores	0.79(0.11) ^{2a,3a,4a}	1.00(0.14) ^{1a,4a}	-0.07(0.08) ^{1a,4a}	-0.75(0.13) ^{1a,2a,3a}
Attuning				
Raw scores (1-7)	6.61(0.04) ^{2a,3a,4a}	6.19(0.04) ^{1a,3a,4a}	5.68(0.04) ^{1a,2a,4a}	4.94(0.05) ^{1a,2a,3a}
Z-scores	0.95(0.13) ^{2a,3a,4a}	1.10(0.13) ^{1a,3a,4a}	-0.14(0.09) ^{1a,2a,4a}	-1.15(0.14) ^{1a,2a,3a}
Demanding				
Raw scores (1-7)	2.51(0.07) ^{2a,4a}	4.62(0.07) ^{1a,3a,4a}	2.42(0.05) ^{2a,4a}	3.87(0.08) ^{1a,2a,3a}
Z-scores	-0.60(0.20) ^{2a,4a}	0.45(0.13) ^{1a,3a,4a}	-0.64(0.11) ^{2a,4a}	0.52(0.16) ^{1a,2a,3a}
Domineering				
Raw scores (1-7)	1.78(0.07) ^{2a,4a}	3.71(0.09) ^{1a,3a,4b}	1.66(0.05) ^{2a,4a}	3.30(0.09) ^{1a,2b,3a}
Z-scores	-0.60(0.15) ^{2a,4a}	0.09(0.18) ^{1a,3a,4b}	-0.63(0.10) ^{2a,4a}	0.63(0.18) ^{1a,2b,3a}
(De)motivating styles				
Structure (1-7)	6.53(0.04) ^{2a,3a,4a}	6.28(0.04) ^{1a,3a,4a}	5.56(0.03) ^{1a,2a,4a}	5.33(0.04) ^{1a,2a,3a}
Autonomy support (1-7)	6.40(0.04) ^{2a,3a,4a}	5.85(0.04) ^{1a,3a,4a}	5.44(0.04) ^{1a,2a,4a}	4.66(0.05) ^{1a,2a,3a}
Control (1-7)	2.40(0.06) ^{2a,4a}	4.28(0.06) ^{1a,3a,4a}	2.71(0.04) ^{2a,4a}	3.61(0.07) ^{1a,2a,3a}
Motivation to teach				
Intrinsic (1-5)	4.87(0.04) ^{3a,4a}	4.78(0.04) ^{4a}	4.68(0.03) ^{1a,4a}	4.42(0.06) ^{1a,2a,3a}
Identified (1-5)	4.88(0.03) ^{3a,4a}	4.80(0.03) ^{3a,4a}	4.61(0.04) ^{1a,2a,4a}	4.35(0.06) ^{1a,2a,3a}
Introjected (1-5)	2.87(0.10) ^{2a,4c}	3.52(0.09) ^{1a,3a,4c}	2.75(0.08) ^{2a,4a}	3.22(0.09) ^{1c,2a,3c}
External (1-5)	1.76(0.08) ^{2a,4a}	2.42(0.08) ^{1a,3a}	1.75(0.05) ^{2a,4a}	2.25(0.08) ^{1a,3a}
Amotivation (1-5)	1.03(0.02) ^{2c,4a}	1.11(0.03) ^{1c,4b}	1.06(0.02) ^{4a}	1.28(0.05) ^{1a,2b,3a}
Work-related outcomes				
Job Satisfaction (1-10)	8.67(0.12) ^{3b,4a}	8.36(0.14) ^{4b}	8.13(0.09) ^{1b,4c}	7.74(0.12) ^{1a,2b,3c}
Prof. performance (1-9)	7.74(0.12) ^{3c,4a}	7.38(0.13) ^{4c}	7.38(0.14) ^{1c,4c}	6.99(0.12) ^{1a,2c,3c}

Note. H = highly; M = moderately, L = Lowly. Numbers in superscript indicate significantly different profiles with the level a = $p < .001$, b = $p < .01$, c = $p < .05$.

Figure 2.

Description of the four latent profiles based on standardised (upper side) and raw (lower side) scores.



Note. H = highly; M = moderately; L = lowly.

Differences in PE Teachers' Motivation and Work-Related Outcomes Across (De)Motivating Teaching Profiles.

Overall mean equality tests showed significant differences across the four profiles for intrinsic motivation ($\chi^2=51.129$, $p<.001$), identified regulation ($\chi^2=77.862$, $p<.001$), introjected regulation ($\chi^2=48.905$, $p<.001$), external regulation ($\chi^2=76.973$, $p<.001$), amotivation ($\chi^2=29.245$, $p<.001$), job satisfaction ($\chi^2=34.010$, $p<.001$), and professional performance ($\chi^2=19.336$, $p<.001$).

Table 3 displays pairwise profile comparisons with profile 1 (“highly structuring - highly autonomy-supportive - lowly controlling”) and 2 (“highly structuring - highly autonomy-supportive - highly controlling”) being highest on intrinsic motivation, identified regulation, job satisfaction, and professional performance. Further, profile 1 (“highly structuring - highly autonomy-supportive - lowly controlling”) and profile 3 (“moderately structuring - moderately autonomy-supportive - lowly controlling”) were lowest on external regulation and amotivation. Profile 2 (“highly structuring - highly autonomy-supportive - highly controlling”) was greatest on introjected regulation, and again the highest, but sharing with profile 4 (“moderately structuring - lowly autonomy-supportive - moderately controlling”) on external regulation. Profile 4 (“moderately structuring - lowly autonomy-supportive - moderately controlling”) was lowest on intrinsic motivation, identified regulation, job satisfaction, and professional performance, as well as highest on amotivation.

Discussion

The present research aimed to identify how PE teachers combine structuring approaches with autonomy-supportive or controlling approaches via a person-centered approach and to analyze how these combinations differ regarding their motivation for teaching, job satisfaction, and professional performance. The main study findings revealed that: a) PE teachers generally provide high levels of structure; b) PE teachers combine structure with autonomy-supportive and controlling approaches to different degrees; c) PE teachers who provide structure in combination with autonomy support were generally more adaptive in motivational and work-related outcomes; d) PE teachers who provide structure in combination with control had more maladaptive patterns; and e) PE teachers who provide structure in a highly autonomy-supportive and controlling way showed a mixed profile with high levels of intrinsic motivation and identified regulation yet also more introjected and external regulation.

How Do PE Teachers Combine Structure, Autonomy Support, and Control? (Aim 1)

In an absolute sense, PE teachers in all four identified profiles were relatively structuring, with all averages for teachers’ structuring style scoring 5 or higher on a 7-point scale independent from the profile they were in. These elevated levels of structure align with previous variable-centered research (e.g., Burgueño, Abós, et al., 2024; García-Cazorla, García-González, et al., 2024). This is positive as a structuring style is related to an array of positive affective (i.e., experiences), cognitive (i.e., learning-related), and behavioral (i.e., intention to be active) outcomes among students

(Vasconcellos et al., 2020) and with autonomous motivation for teaching, teaching efficacy, and job satisfaction in teachers (Cheon et al., 2020). Yet, depending on the profile teachers were in, these structuring styles were either combined with higher (i.e., profile 1) or moderate (i.e., profile 3) levels of autonomy support and low levels of control, or they combined structure with relatively lowly (i.e., profile 4) to high (i.e., profile 2) levels of autonomy-support, and moderately (i.e., profile 4) to high (i.e., profile 2) levels of control.

Indeed, consistent with our hypotheses and following previous research (Burgueño, García-González, et al., 2024; García-González et al., 2023; Haerens et al., 2018; Wallace et al., 2014), four profiles with varying degrees of structure, autonomy support, and control were identified in the eyes of PE teachers. Akin to previous person-centered research in PE students (García-González et al., 2023; Haerens et al., 2018), we identified a profile named “highly structuring - highly autonomy-supportive - lowly controlling” (profile 1). This profile shows that it is possible to provide very high levels of structure in combination with high levels of autonomy-support, without gliding into a controlling style. Yet as only 19% of the teachers positioned themselves in this most adaptive (see further results) profile, this may indicate that it is a challenge for teachers to refrain from becoming controlling when being highly structuring and highly autonomy-supportive. Although we did find a relatively large group of teachers (38%) who was labelled “moderately structuring - moderately autonomy-supportive - lowly controlling” (i.e., profile 3), thus still having a relatively adaptive profile in terms of need-support/thwarting towards their students. These two profiles suggest that structure can go hand-in-hand with relatively high levels of autonomy support and relatively low levels of control. The significant, positive, and moderate correlations between structuring and autonomy-supportive approaches (i.e., $r=.20$ to $.56$, $p<.001$) confirm this reasoning, implying the synergetic provision of both structure and autonomy support is possible as was also reported in prior research (Sierens et al., 2009).

Yet, there is a group of teachers (22%) who combine high levels of structure, autonomy-support, and control (i.e. profile 2, “highly structuring - highly autonomy-supportive - highly controlling”). This profile seems to indicate that for some teachers a natural synergy exists between the provision of structure and both autonomy support as well as control, which is in congruence with the SDT-based circumplex approach which positions structure in between both styles (Aelterman et al., 2019; Burgueño, Abós, et al., 2024). Under the circumplex lens (Aelterman et al., 2019; Burgueño, Abós, et al.,

2024), the current study's moderate-to-high correlations among adjacent approaches (i.e., between guiding and attuning approaches (i.e., $r=.56$, $p<.001$), and between clarifying and demanding approaches (i.e., $r=.24$, $p<.001$)) underpinned the notion that structure can be provided with high autonomy support and control at once. According to Wallace et al. (2014), when PE teachers provide guiding and clarifying elements of structure, they do it by giving students voice and decision power (i.e., participative approach), explaining to them the importance of the activity (i.e., attuning approach), as well as using strict commands seeking to highlight mistakes and requesting a good performance (i.e., demanding approach). Finally, a last profile constituting 21% of the sample was not exactly the same as the one hypothesised (structure in combination with low autonomy support and high control), but does bear a considerable resemblance, as it features a relatively moderate structure with lowly autonomy-supportive and moderately levels of control. This makes sense if we consider recent person-centered studies (e.g., García-González et al., 2023; Haerens et al., 2018), showing a profile with control values (Z-scores) that are higher than the other need-supportive teaching styles.

Differences in Motivation for Teaching and Work-Related Outcomes Across Combinations of Structure, Autonomy-Support, and Control (Aim 2)

Consonant with our hypothesis and previous SDT-based studies (Burgueño, García-González, et al., 2024; García-González et al., 2023; Haerens et al., 2018), PE teachers who perceived themselves as providing structure combined with high levels of autonomy support and low levels of control (i.e., profile 1) were highly autonomously motivated, satisfied with their job, and performed better at work. Following previous studies (Abós, Haerens et al., 2018; García-Cazorla, García-González, et al., 2024; Van den Berghe et al., 2014; Vermote et al., 2020), PE teachers who interpret teaching PE as something valuable and informative for student learning (i.e., intrinsic motivation and identified regulation), provide structure using many participative and attuning practices, irrespective of control. As highlighted by García-Cazorla, García-González, et al. 2024, PE teachers autonomously motivated tend to engage students more actively, using autonomy-supportive methods that consider students' preferences during lessons. Additionally, such teachers often employ structuring approaches, clearly defining learning goals and offering targeted guidance and feedback to enhance students' ability to fulfill classroom expectations effectively. Moreover, these teachers tend to hold positive judgments and beliefs about their job performance (Richards et al., 2017).

However, the development of adaptive motivational and work-related outcomes could be subject to a dual process, this is, PE teachers providing structure in a predominantly autonomy-supportive way (i.e., profile 1), yet also PE teachers providing structure with high levels of autonomy support and control (i.e., profile 2). In line with SDT (Ryan & Deci, 2017) and past studies (Abós, Haerens et al., 2018; Vermote et al., 2020), the latter group of teachers (i.e., highly structuring-highly autonomy-supportive-highly controlling) was more controlled motivated, suggesting that structure provided using high control, despite the presence of autonomy-support, has a motivational cost for them.

Between the most and least adaptive profiles, two groups fell in between: the “highly structuring - highly autonomy-supportive - highly controlling” profile (i.e., profile 2) and the “moderately structuring - moderately autonomy-supportive - lowly controlling” profile (i.e., profile 3). While the first group had a relatively adaptive profile in terms of intrinsic motivation, identified regulation, job satisfaction, and professional performance, this was not the case when inspecting introjected regulation, external regulation, and amotivation. The second profile specifically reported higher introjected regulation than all other groups, higher external regulation than the “highly structuring - highly autonomy-supportive - lowly controlling” profile and the “moderately structuring - moderately autonomy-supportive - lowly controlling” profile, and furthermore, their amotivation was higher compared to the “highly structuring - highly autonomy-supportive - lowly controlling” profile. In line with previous studies (Abós, Haerens et al., 2018), these findings reinforce the idea that the internal and external pressure that PE teachers with controlled motivation have, may lead them to transfer that pressure to their students, using a tone of discipline and exercising a predominant power role over them. Overall, considering the negative impact of lower-quality motivation on PE teachers (Abós, Haerens et al., 2018; Van den Berghe et al., 2014), these findings seem to indicate that providing structure with moderate autonomy support is more adaptive for teachers’ motivation than the provision of structure in combination with high autonomy support and control for PE teachers.

Moreover, in the two profiles with moderate (i.e., profile 2) and high (i.e., profile 4) levels of control, we can observe the highest levels of introjected regulation, external regulation, and amotivation. However, the profile that shows higher levels of controlled motivation (i.e., profile 2) also exhibits higher levels of a controlling style, while the profile that shows higher levels of amotivation (i.e., profile 4) is the one that

presents lower levels of structure and autonomy support, despite having slightly lower levels of control. When teachers themselves feel significant pressures to teach, whether external or internal, they are more likely to transfer these feelings of pressure to the students, manifesting in a more controlling style (Haerens et al., 2018). However, when a teacher teaches without interest and fails to understand the value of teaching, it becomes more difficult for them to create an educational environment that fosters interest and curiosity among students (Pelletier & Rocchi, 2016).

Finally, in line with previous person-centered studies, in which they analysed students' perception of their teachers' performance in PE classes (Burgueño, García-González, et al., 2024; García-González et al., 2023; Haerens et al., 2018) and our hypothesis, PE teachers who perceived themselves as providing structure in combination with control, and relatively low levels of autonomy support (i.e., profile 4), were lowest on higher-quality motivation, job satisfaction, and professional performance and highest on amotivation. Following past studies (Abós, Haerens et al., 2018; Vermote et al., 2020), it seems that the lack of value, interest, and energy towards their work that characterizes those PE teachers highest on amotivation, makes it difficult for them to generate a receptive and organised environment that encourages students' learning, justifying relatively lower levels of autonomy-support. This amotivation and low energy towards their work may be the reason why this study did not find a purely controlling profile as initially hypothesised (structure with low autonomy support and high control). Exercising a very high level of control also requires a certain amount of energy, as a controlling teacher is one who makes all the decisions in PE classes (Aelterman et al., 2019). This could explain why this group of teachers would provide structure with moderate control, more than high control. So, basically, imposing the natural hierarchy existing in the educational context (i.e., teacher vs. student) which does not require a great effort from teachers, could be sufficient to fulfill their work obligation. Indeed, research shows that PE teachers providing structure with low autonomy support and moderate control could hardly trigger their students' positive experiences, even being detrimental to students' outcomes (Haerens et al., 2018; Vasconcellos et al., 2020). As these students' negative experiences happen in the same space and time as PE teachers teach (Pelletier & Rocchi, 2016), it is tenable to think about reciprocal effects (Jang et al., 2024) that could explain high amotivation and low job satisfaction and professional performance experienced by this group of PE teachers.

Implications for Practice

Importantly, 57% of the participating PE teachers perceive themselves as providing structure in highly-to-moderately autonomy-supporting and lowly controlling ways (i.e., profiles 1 and 3). Another reading is that four out of every 10 teachers reported they cannot provide structure in a more autonomy-supportive than controlling way for an effective PE lesson. Thus, initial and continuous education programs need theoretical and practical resources for PE teachers to effectively provide structure combined with predominantly autonomy-supportive strategies and avoidance of controlling tactics as much as possible. For example, when an activity is introduced, the PE teacher clearly informs the students of the goals and rules (i.e., clarifying approach) and explains to them how to complete it with useful directions and skill-building feedback (i.e., guiding approach), for which (s)he dialogues with them on rules and alternatives for the successful development (i.e., participative approaches), in addition to arguing the importance of the activity itself for their learning (i.e., attuning approach). At the beginning of the course, when the PE teacher presents the learning expectations and classroom rules for optimal functioning (i.e., clarifying approach), instead of imposing them on the students and listing possible sanctions (i.e., demanding approach), teachers are suggested to give students voice to agree with a set of classroom rules that are seen as owned (i.e., participative approach). Similarly, when the PE teacher provides students with step-by-step directions, practical tips, and learning-orientated feedback for an activity requiring much effort from students (i.e., guiding approach), instead of imposing his/her powerful position over them by creating embarrassing situations based on disapproval or public shaming when they fail (i.e., domineering approach), the teacher is recommended to try to find new ways to make the activity more fun and interesting (i.e., attuning approach). As it is common for PE teachers to also adopt a tunnel-view to introduce guiding and clarifying elements for activity development by using strict commands and verbal expressions of discipline (i.e., demanding approach) and taking a power role (i.e., domineering approach), it is important to make them aware of the downsides of such approaches both for themselves, in terms of their motivation, job satisfaction and professional performance (current study), as well as for their students in terms of PE experiences, learning perceived, and intention to be active (Vasconcellos et al., 2020).

Limitations and Future Directions

A first limitation of this study is its cross-sectional design, which makes it impossible to examine whether the combination of styles predicts teacher outcomes or vice versa, whether PE teachers' motivation and work-related outcomes are predictive of their motivating style. As the PE teachers' provision of structure combined with autonomy support and control may fluctuate at different moments of the academic course, longitudinal and daily-diary research could be a new avenue of research. A second limitation is the non-probabilistic sampling method to recruit PE teachers. Future research could try testing the hypotheses with a larger and more representative sample of PE teachers. Third, job satisfaction and professional performance were measured via a single-item scale, although valid, for which the reliability coefficient cannot be calculated. Finally, it seems also interesting to obtain additional information that is not exclusively from self-reported questionnaires. Thus, future research integrating students' perceptions and/or researchers' observations could help to obtain a triangulated, realistic, and precise point of view of (de)motivating teaching approaches.

Conclusions

The results of this study manifest that, depending on the motivational process of PE teachers towards their work, they will tend to combine a structuring style with high or low levels of autonomy support and control, which will ultimately affect different work-related outcomes. According to our findings, PE teachers who tend to be more autonomously motivated combine high levels of structure with high levels of autonomy support and low levels of control and are ultimately more satisfied with their job and perform better at work. Conversely, those who tend to exhibit controlled forms of motivation and higher levels of amotivation provide structure with high or moderate levels of control and tend to be less satisfied with their job and perform worse. To maximize motivational and work-related benefits, PE teachers are advised to provide structure combined with high autonomy support given that both seem to go hand-in-hand in the instructional practice. PE teachers are also recommended to avoid the provision of structure in combination with control because of detrimental relations with PE teachers' motivation and work-related outcomes. Finally, it is important to highlight the importance of creating training programs for PE teachers, centered on increasing levels of autonomy support and structure, and avoiding, or at least reducing, those levels of control that seem to be so prevalent and normalised among PE teachers.

4.3. Estudio 3: A Motivational Training Programme for Secondary Physical Education Teachers Based on the Circumplex Model: A Study Protocol of a Randomised Controlled Trial

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Abstract

Introduction: In most self-determination theory (SDT) research, improving (de)motivating teaching styles provides numerous benefits for students and teachers, although there is less evidence of the latter. Although the recent circumplex model provides a fine-grained picture of the different (de)motivating teaching styles (i.e., autonomy support, structure, control, and chaos) that physical education (PE) teachers can use in their lessons, no previous motivational training programmes have been based on this model. Moreover, all SDT-training programmes have been implemented through different group sessions, but individual sessions have not been delivered.

Objective: This study outlines the protocol of a motivational training programme, derived from the circumplex model, designed to enhance motivating teaching styles (and prevent or decrease demotivating teaching styles) among PE teachers. Consequently, this programme seeks to improve motivational variables and influence (mal)adaptive outcomes in both teachers and students.

Design: A randomised controlled trial design with a mixed-method approach.

Participants: At least 16 secondary PE teachers will be assigned to either an experimental group or a control group, together with some of their students.

Intervention: The training programme comprises four face-to-face group sessions and two follow-up sessions (one individual and one group session). PE teachers will learn how to support autonomy and provide structure, as well as to be less controlling and chaotic towards students. Over approximately five months, teachers will implement these motivational strategies during their PE classes.

Outcome Measures: Different (de)motivating teaching styles, motivational variables, and (mal)adaptive outcomes will be assessed in both PE teachers and their students at three distinct points: before the training programme (T1), during the intervention (T2), and at the end of the intervention (T3). Additionally, two discussion groups involving all experimental PE teachers will be held (one following the training programme and another at the end of the intervention).

Conclusion: The results from this study could be useful for developing motivational training programmes for in-service PE teachers.

Trial registration: ClinicalTrials.gov (Identifiers: NTC06479369 / Unique protocol ID: PID2021-127897NA-I00)

Keywords: circumplex approach, motivating styles, professional development, self-determination theory, psychological needs, motivation.

Introduction

Physical Education (PE) teachers play a pivotal role in guiding students through their learning process. Drawing on the Self-Determination Theory (SDT; Ryan & Deci, 2020), teachers' (de)motivating style, referred to as "the interpersonal sentiment and behaviour that teachers rely on during instruction to motivate students to engage in and benefit from learning activities" (Reeve et al., 2014, p. 94), is a crucial element in the teaching process. Recent research suggests that PE teachers employ a diverse array of teaching behaviours in their educational practice (Burgueño, García-González, et al., 2024). Autonomy, competence, and relatedness-supportive teaching behaviours (i.e., need-supportive teaching behaviours) have been positively related to students' autonomous motivation and adaptive outcomes in PE, while the opposite is true for autonomy, competence, and relatedness-thwarting behaviours (i.e., need-thwarting behaviours) (Vasconcellos et al., 2020; White et al., 2021). Consequently, continuous development teaching (CDT) programmes based on SDT (Ryan & Deci, 2017), have increased in the last years. These SDT-training programmes, mainly focused on autonomy-supportive strategies, revealed positive effects on students' perceptions of (de)motivating teaching behaviours and motivational outcomes (Vasconcellos et al., 2020). Over the past decade, SDT-training programmes have also positively affected teachers' self-perceptions of certain antecedents, support for autonomy and structure, and various motivational and (mal)adaptive outcomes (Reeve & Cheon, 2021). However, additional research is required, as most studies have not focused on reducing need-thwarting behaviours.

Recently, grounded in SDT (Ryan & Deci, 2017), the circumplex model (Aelterman et al., 2019) offers a detailed view of the different (de)motivating teaching styles (i.e., autonomy support, structure, control, and chaos) that teachers can adopt in their classes. This circumplex model delineates eight teaching approaches across these four teaching styles (Aelterman et al., 2019; Escrivá-Boulley et al., 2021). To develop the most effective interventions, it is crucial for researchers to understand the effectiveness of motivational training programmes, not only in terms of the four (de)motivating teaching styles but also across the eight specific teaching approaches. Yet, no existing motivational training programmes have incorporated this new circumplex approach. This mixed-method study sets out to expand existing knowledge by describing a protocol for a motivational training programme based on the circumplex

model, aimed at enhancing motivating teaching styles, as well as adaptive outcomes among PE teachers and their students.

Self-Determination Theory: The Importance of Basic Psychological Needs in Teaching

According to SDT (Ryan & Deci, 2017), PE teachers should satisfy the three basic psychological needs (i.e., autonomy, competence, and relatedness) in teaching to experience well-being and feel fulfilled in their jobs. However, it has been established that these needs can also be frustrated (Vansteenkiste et al., 2020). Autonomy satisfaction is linked with PE teachers' sense of making their own decisions and implementing their ideas in lessons, whereas autonomy frustration arises from feelings of compulsion to teach in prescribed ways and experiencing pressure in work-related tasks. Competence satisfaction involves PE teachers' perception of success and effectiveness in their PE lessons, whereas competence frustration refers to experiencing feelings of ineffectiveness and failure in their teaching-related tasks. Lastly, relatedness satisfaction is experienced by PE teachers when they feel connected and integrated with their colleagues and students, while relatedness frustration occurs when they feel isolated and excluded in their work environment (Ryan & Deci, 2017; Vansteenkiste et al., 2020). According to SDT, teachers' need satisfaction and frustration can be influenced by several antecedents, including contextual factors, personal factors, and perceptions of others' behaviours and motivation (Haerens et al., 2016; Matosic et al., 2016). Moreover, in alignment with SDT, these PE teachers' need-based experiences significantly influence their well-being and play a crucial role in the (de)motivating teaching styles they adopt during PE lessons. Previous SDT-based research (Slemp et al., 2020) indicates that teachers' need satisfaction is positively associated with different adaptive outcomes (e.g., well-being, job satisfaction, engagement, etc.) and need-supportive teaching behaviours towards students. However, teachers' need frustration has been positively related to maladaptive outcomes (e.g., distress, burnout, etc.) and need-thwarting teaching behaviours towards students. Therefore, addressing certain antecedents of (de)motivating teaching styles could enhance teachers' need satisfaction and reduce their frustration, consequently facilitating the adoption of motivating teaching behaviours.

A Fine-Grained Picture of (De)Motivating Teaching Styles: A Circumplex Model

The circumplex model offers a deeper and more detailed perspective of the four teaching styles a PE teacher can employ in their lessons (Aelterman et al., 2019). These

styles are categorised along two axes: one horizontal, indicating whether the style supports or thwarts students' needs, and one vertical, reflecting the degree of the directiveness exhibited by the PE teachers. Each teaching style is further divided into two distinct approaches, culminating in a total of eight specific teaching approaches (Aelterman et al., 2019).

On the one hand, the first motivating teaching style, characterised by low directiveness and high need support, is termed autonomy support. PE teachers who demonstrate a tone of receptivity and flexibility to accommodate the preferences and interests of their students provide an autonomy-supportive environment (Vansteenkiste et al., 2019). Autonomy support can emerge through a participative (i.e., PE teacher provides students with choices and decision-making power) and attuning teaching approach (i.e., PE teacher fosters students' interests, accepts expressions of negative affect, and explains the relevance of each activity performed). The second motivating teaching style, characterised by high directiveness and high need support, is termed structure (Aelterman et al., 2019). Structure involves PE teachers adopting attitudes oriented towards progress and process, always considering each student's ability levels and the needs (Vansteenkiste et al., 2019). The structuring style is displayed by a guiding (i.e., PE teacher provides students with helpful guidelines and encouragement for successful task completion) and a clarifying teaching approach (i.e., PE teacher communicates the goals and expectations of the lessons to the students) (Escriva-Boulley et al., 2021).

On the other hand, the first demotivating teaching style, characterised by high directiveness and high levels of need-thwarting, is termed control. It refers to those PE teachers who exert pressure on students to think, feel, and behave in specific ways (Vansteenkiste et al., 2019). This controlling style can be expressed by a demanding (i.e., PE teacher imposes mandatory actions on their students and administers punishment or threats if they fail to comply) and a domineering teaching approach (i.e., PE teacher uses manipulative strategies such as inducing shame, disapproval, or even humiliation to comply with their requests) (Burgueño, Abós, et al., 2024). The second demotivating teaching style, characterised by low directiveness and high levels of need-thwarting, is termed chaos. It refers to those PE teachers who adopt a laissez-faire approach, characterised by their unpredictable and inconsistent behaviour (Vansteenkiste et al., 2019). The chaotic style is expressed by an abandoning (i.e., after multiple failed attempts, the PE teacher resigns and leaves the students to fend for

themselves) and an awaiting teaching approach (i.e., PE teachers do not plan lessons extensively as they prefer to wait and see how things unfold) (Aelterman et al., 2019).

Previous studies based on SDT and the circumplex model (Burgueño, Abós, et al., 2024; García-Cazorla, García-González, et al., 2024) have shown that teachers whose needs are satisfied implement autonomy-supportive (i.e., participative and attuning approaches) and structuring styles (i.e., guiding and clarifying approaches) in their PE classes, while those teachers whose needs are frustrated use controlling (i.e., demanding and domineering approaches) and chaotic styles (i.e., abandoning and awaiting approaches). According to SDT, adopting these (de)motivating teaching styles/approaches by PE teachers may lead to various motivational consequences for students.

Influence of (De)Motivating Teaching Approaches on Students' Motivational Outcomes

Grounded in the circumplex model, a growing body of research examines the relationship between (de)motivating teaching styles/approaches and students' motivational outcomes. For example, Burgueño, Abós et al. (2024) demonstrated that students' perceptions of autonomy-supportive (i.e., participative and attuning) and structuring (i.e., guiding and clarifying) styles by PE teachers are positively related to students' need satisfaction, but the clarifying approach is also negatively associated with students' need frustration. Dilo-Peña et al. (2024) also showed that those students who perceived autonomy-supportive and structuring styles and approaches reported higher values in positive PE experiences, learning in PE, and intention to participate in physical activity (PA). Conversely, Burgueño, Abós et al. (2024) showed that controlling (i.e., demanding and domineering approaches) and chaotic (i.e., abandoning and awaiting approaches) styles are positively associated with students' need frustration but that the domineering and abandoning approaches are also negatively associated with students' need satisfaction. Additionally, comprehensive SDT-based research in PE indicates that students' need satisfaction is positively related to autonomous motivation and positive behavioural, affective, and cognitive outcomes, whereas students' need frustration is positively related to controlled motivation, amotivation, and various maladaptive outcomes (Vasconcellos et al., 2020). Consequently, given the associated benefits for students, SDT-training programmes aimed at improving PE teachers' motivating teaching style have increased in recent years.

Previous SDT-Training Programmes for PE Teachers and Added Value of this Study

SDT-training programmes have predominantly concentrated on autonomy-supportive strategies, revealing positive effects on students' perceptions of their PE teachers' (de)motivating teaching styles/approaches, as well as on motivational outcomes in PE lessons (Vasconcellos et al., 2020). A previous review of SDT-training programmes also suggested that PE teachers can benefit from participating in these programmes, although more research is needed to examine their effects on a wide range of outcomes (Reeve & Cheon, 2021). However, there are very few SDT-training programmes that examine their effects on both students and teachers. For example, Cheon et al. (2020) showed that PE teachers who participated in an eight-hour, three-session face-to-face SDT-training programme, focused on providing structure in an autonomy-supportive way, showed improvements across all assessed variables (i.e., teacher-reported autonomy support and structure, teaching efficacy, intrinsic instructional goals, harmonious passion, job satisfaction, and relationship satisfaction with students). Moreover, students also perceived improvements in autonomy and structure support, autonomy and competence satisfaction, and outcomes such as classroom engagement, skill development, anticipated PE performance, and future intention to do PA. Notably, in most of these SDT training programmes, the effects on teachers have only been assessed after implementing the strategies with the students (Aelterman et al., 2013). Gaining insight into teachers' perspectives both before the training, immediately after the SDT-training programme, and upon completion of the entire intervention could enhance the programme's acceptance, sustainability, and scalability. To achieve this, employing a qualitative methodology (in addition to quantitative) could build on existing findings, providing greater justification for the results obtained.

To our knowledge, no previous motivational training programmes have been designed based on the circumplex model. This model can guide the teaching approaches associated with each of the (de)motivating styles and provide a better understanding of the potential effects of the programme on each of the eight teaching approaches. In the educational domain, only three programmes to date have examined the effects of SDT-training programmes on (de)motivating teaching styles, using the Situations-in-School Questionnaire (SIS; an instrument to assess the eight teaching approaches proposed by the circumplex model) (Cheon et al., 2020; Conesa et al., 2023; Jang et al., 2023). However, none of these programmes have specifically examined the effects of all eight

teaching approaches proposed by the circumplex model. In addition, few SDT-training programmes have focused on reducing controlling and chaotic teaching styles. As teachers may combine need-supportive and need-thwarting approaches (Burgueño, García-González, et al., 2024), it seems necessary for these programmes to also focus on reducing these behaviours.

The characteristics, content, and implementation mode of the SDT-training programmes also appear to be crucial factors to consider. To date, all SDT-training programmes have been implemented through different group sessions with PE teachers. However, different person-centred studies have indicated that each PE teacher may exhibit a very different (de)motivating teaching style profile (Burgueño, García-González et al., 2024). For instance, one teacher might employ both autonomy-supportive and structuring styles alongside a controlling style. Conversely, another teacher might use autonomy-supportive behaviours while lacking structure, resulting in a chaotic classroom environment. Therefore, it seems necessary for at least part of the motivational training programme to be tailored to each teacher's (de)motivating teaching profile and personal characteristics. The use of observational methodology in teacher's classes has emerged in recent years as a solution to provide constructive and individual feedback through videos (Bouten et al., 2023). However, to date, it has only been used in SDT-training programmes to examine intervention fidelity and/or to assess possible changes in the (de)motivating teaching styles (Reeve & Cheon, 2021). Combining a brief initial theoretical component with a more extensive practical part (i.e., microteaching) has been previously identified as essential for applying what has been learned in contexts as close to reality as possible (Aelterman et al., 2013). Ultimately, the adoption of a congruent style, where trainers implement the programme using (de)motivating teaching styles, has also been positively perceived by PE teachers. This approach allows them to observe real-life examples of how to implement these strategies effectively (Aelterman et al., 2013). Moreover, in line with SDT, it could lead to an immediate effect on the teachers' need satisfaction during the training, which has been positively associated with effectiveness and feasibility beliefs in terms of autonomy support and structure, as well as teachers' intentions to apply the proposed strategies (Aelterman et al., 2016).

Finally, while previous studies have considered gender as a covariate to analyse the effects of SDT-based interventions, gender differences in study variables are seldom reported for either teachers or students. Given prior SDT-related research indicating that

(de)motivating teaching behaviours may be perceived differently by male and female students (White et al., 2021) and male and female teachers (García-Cazorla, García-González, et al., 2024), it is crucial to determine whether the intervention is equally effective for both genders to mitigate any potential gender-related inequities.

To extend previous knowledge, this mixed-method study describes the protocol of a motivational training programme, based on the circumplex model, aimed at improving (de)motivating teaching styles/approaches among PE teachers. The first hypothesis suggests that the features of the motivational training programme will be positively perceived by PE teachers (H1). We also hypothesise that experimental female and male school teachers will perceive improvements in their students in several antecedents, autonomy and competence satisfaction/frustration at work, (de)motivating teaching styles/approaches, and (mal)adaptive outcomes at least at the end of the intervention implementation (H2). Finally, both boys and girls from the experimental groups will perceive improvements in their PE teachers' (de)motivating teaching styles/approaches, autonomy and competence satisfaction/frustration in PE, and adaptive outcomes in PE lessons (H3).

Materials and methods

Context, Design, and Randomisation

This study will be carried out in a northeast region of Spain [details masked for review process]. PE is mandatory for every secondary school student in Spain. Each student receives two 50-minute coeducational PE lessons per week. Spanish Secondary PE teachers are expected to teach between 18 and 21 hours per week. Typically, the annual teaching plan of PE teachers includes approximately six to eight distinct teaching units per year. These units encompass various content types such as individual, cooperative, and interactive sports and games, as well as body expression, health-related fitness, and outdoor activities, all outlined in the PE curriculum. The academic year lasts from September to June, divided into three terms, each separated by a holiday period (i.e., Christmas and Easter).

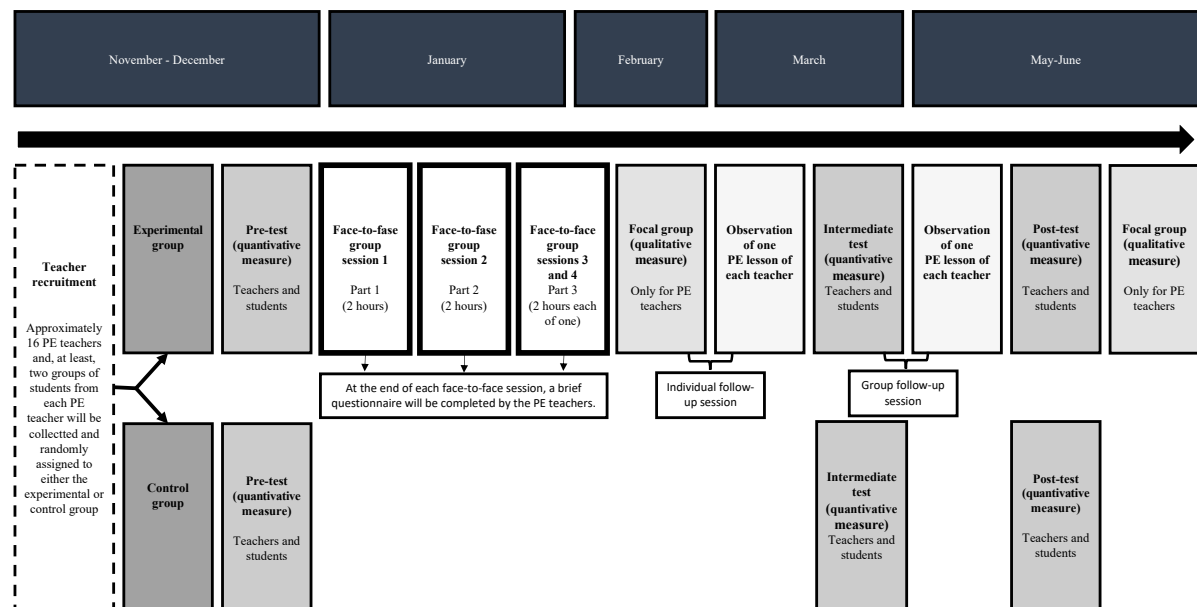
A randomised controlled trial design with a mixed-method approach will be carried out. PE teachers agreeing to participate in the trial will be randomly assigned to either the experimental or the control group. Randomisation will be conducted using the digital tool available at <https://echaloasuerte.com/>. To prevent contamination of the experimental condition, schools will only participate in one group (i.e., experimental or

control). Subsequently, at least two groups of students from each PE teacher will be randomly selected.

This study will comprise two phases: 1) a teacher-training phase and 2) an implementation phase with students. It should be noted that the training programme will continue with some individual and group sessions during the implementation phase. As teachers' and students' perceptions of (de)motivating teaching styles and approaches and other study variables require several months for greater accuracy of their perceptions, the training programme will not start until the second term of the academic year (for more details, see Figure 1).

Figure 1.

Characteristics of the training programme and timeline for data collection



Notes: *the variables assessed in PE teachers and students are detailed in the corresponding section; **the training programme has two follow-up sessions (individual and group).

The study was approved by the Ethics Committee of the University of [details masked for review process] and follows all ethical procedures established in the Declaration of Helsinki.

Sample Size Calculation

The sample size for this intervention-based study was calculated using R Studio to ensure adequate power in the detection of potential statistically significant effects. Considering a multi-level design nesting centre, PE teacher and group, the sample size

calculation was grounded on an anticipated effect size of 0.5, reflecting a moderate impact of the intervention. The power of the study was set at 80% with a significance level (alpha) of .05, aligning with common practices in educational research (McConnell et al., 2019). Acknowledging the inherent structure of this study, an Intra-Class Correlation (ICC) of .10 was assumed based on similar educational settings (Hedges & Hedberg, 2007). This ICC estimate accounted for the expected homogeneity within the three levels (class group within the PE teacher, PE teacher within the centre). To accommodate potential participant dropout, particularly among students, we incorporated a 40% anticipated dropout rate into our calculations (e.g., Meerits et al., 2022). The minimum sample size was adjusted to 210 students across 15 PE teachers, averaging 14 students per teacher. This adjustment ensures that our study maintains sufficient statistical power even in the face of anticipated losses, thereby safeguarding the integrity and validity of our findings.

Participants and Recruitment

At least 16 secondary PE teachers, eight in the experimental group and eight in the control group, along with their respective students, will be expected to participate in this study. The maximum number of participating teachers will be capped at 20, due to the limited human resources of the research team. PE teachers will select at least two classroom groups comprising at least 14 students each to invite to participate in this study. Eligible students will be those aged 12 to 17 years in secondary schools. Participation will be voluntary and anonymous.

Various social media platforms (i.e., Instagram, Twitter, and WhatsApp) and other communication methods (i.e., email) will be used for teachers' recruitment. An informative poster will be launched, detailing the target sample, content, aims, and training programme dates. This poster will also include two links (QR code): one with a document providing further information and another to registration through a brief Google Forms questionnaire. Regarding the additional information document, it is important to note that it will detail a more comprehensive overview of the objectives, the different phases of the programme, inclusion criteria, the requirements that each teacher must accept to participate, and the teaching skills that will be developed during the training programme. Teachers with further inquiries can contact the research team via email or phone. The registration period will last approximately 21 days.

Once the interested PE teachers have registered, various inclusion criteria will be considered for the final selection: 1) Being an in-service PE secondary school teacher

for the entire academic year; 2) Attending 100% of the training programme sessions; 3) Filling in a short questionnaire at the end of each session of the training programme, as well as completing questionnaires of the study variables three times; 4) Allowing the recording of two PE lessons; 5) Participating in two focus groups, one at the end of the training programme and one at the end of the study, and 6) Not participating in other training sessions related to PE instruction during the programme. Moreover, the inclusion criteria for students will be: 1) Authorisation from parents or legal guardians; 2) Completion of questionnaires of the study variables three times; 3) Regular participation in PE lessons.

Measures

Questionnaires

The following PE teachers' variables will be measured using Google Forms before the training programme (T1), as well as during (T2) and at the end of the implementation of the intervention with their students (T3) (see Figure 1):

Socio-Demographic Variables. Age, gender, teaching experience, type of school (public or private), and school location (rural or urban) will be self-reported by teachers.

(De)Motivating Teaching Styles and Approaches Towards Students. To assess self-reported (de)motivating teaching styles toward students, the Spanish version of the SIS in Physical Education (SIS-PE; Burgueño, Abós, et al., 2024) will be used. The SIS-PE comprises 12 typical teaching situations consisting of four items each (i.e., 48 items). Autonomy-supportive items are categorised into participative (four items) and attuning (eight items) approaches. Structure items are operationalised into guiding (seven items) and clarifying (five items) approaches. Control items are divided into demanding (seven items) and domineering (five items) approaches. Chaos items are operationalised into abandoning (eight items) and awaiting (four items) approaches. For instance, this stem phrase “At the start of class...” is followed by four items: “you can explore students’ prior knowledge of the topic (attuning)”, “set up a class clearly and straightforwardly (clarifying)”, “demand application of what is taught (demanding)”, or “just begin and let the class evolve (awaiting)”. It should be noted that, as teachers’ perceptions of their (de)motivating teaching styles could be different according to the classroom group, teachers will have to answer the questionnaire taking into account the groups of students selected for the study. Teachers’ responses will be assessed using a

7-point Likert scale ranging from 1 (*Does not describe me at all*) to 7 (*Describes me perfectly*).

Autonomy and Competence Satisfaction and Frustration at Work. To assess PE teachers' perceptions of autonomy and competence satisfaction and frustration at work, the Spanish version of the Basic Psychological Needs at Work Scale for in-service teachers (Abós, Sevil-Serrano, et al., 2018) and the Basic Psychological Need Satisfaction and Frustration Scale (Chen et al., 2015) will be used, respectively. Four of the six factors of these scales will be assessed, except for relatedness satisfaction and frustration. Both scales are preceded by the stem "In my job as a PE teacher..." and assess autonomy satisfaction (Four items; e.g., "My job allows me to make decisions"), autonomy frustration (Four items; e.g., "I feel that most of the things I do in my job, I do them because I have to do them"), competence satisfaction (Four items; e.g., "I have the ability to do my job well"), and competence frustration (Four items; e.g., "I have serious doubts that I can do in my job well"). Teachers' responses will be assessed using a 5-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*).

Job Satisfaction at Work. Teachers' perceptions of job satisfaction at work will be assessed using a Spanish translation (Abós et al., 2019) of the Teacher Job Satisfaction Scale (TJSS; Skaalvik & Skaalvik, 2011). This four-item scale includes a single factor (e.g., "I enjoy working as a teacher"). Teachers' responses will be registered on a 6-point Likert scale from 1 (*strongly disagree*) to 6 (*strongly agree*).

Emotional Exhaustion at Work. Teachers' emotional exhaustion will be assessed using the Spanish version of the Maslach Burnout Inventory-General Survey (Gil-Monte, 2002). In line with other studies on PE teachers (Richards et al., 2019), only the five items assessing the exhaustion factor will be used in the present study (e.g., "I feel burned out from my work"). Teachers' responses will be reported on a 7-point Likert scale from 0 (*never*) to 6 (*every day*).

Job Performance. Teachers' perceptions of their professional performance will be assessed using the following sentence: "Rate your satisfaction with your professional performance this academic year", which has been previously used in other studies (Barrick et al., 2002). Teachers' responses will be provided on a 9-point Likert scale, ranging from 1 (*non-existent*) to 9 (*excellent*).

Quality of the Training Programme. Consistent with previous studies (Aelterman et al., 2013; Cheon & Reeve, 2015; Slingerland et al., 2017), a short paper-and-pencil questionnaire will also be applied immediately after each session of the

training programme to gain insight into their content. Questions will be related to: (1) interaction, (2) innovation, (3) interest, (4) intelligibility, (5) essentiality, (6) practical usefulness, (7) feasibility of the motivating strategies, (8) intention to implement the motivating strategies, (9) the extent to which one would recommend the training to others, (10) perceived changes in their (de)motivating styles, and (11) overall satisfaction. This questionnaire will be rated on a 5-point Likert scale from 1 (*totally disagree*) to 5 (*totally agree*), except for the last question, in which teachers will rate the overall satisfaction on a scale from 1 to 10. Lastly, in an open-ended question, teachers will be able to detail the strengths and areas for improvement in each session to make slight adjustments to the training programme in their future implementation.

Like their teachers, students will fill out the following questionnaires before the training programme (T1), as well as during (T2) and at the end of the implementation of the intervention by the PE teachers (T3) (See Figure 1). Depending on the protocol of each school, these questionnaires will be completed in paper-and-pencil format or using Google Forms in a quiet classroom environment. The PE teacher will not be present when their students complete the questionnaires to avoid response bias. In this sense, a member of the research will help the students with any doubts.

Socio-Demographic Variables. Age, gender, and school grade level will be self-reported by students.

(De)Motivating Teaching Styles and Approaches. To assess students' perceptions of (de)motivating teaching approaches of their PE teachers, the Spanish version of students of the Situations-in-School Questionnaire in Physical Education (SIS-PE; (Burgueño, Abós et al., 2024) will be used. The only change in the instrument compared to the teachers' instrument is the structure of the sentences, as they are written from the students' perspective (e.g., "Your teacher invites you to suggest a set of norms or rules").

Autonomy and Competence Satisfaction and Frustration in PE. To assess students' perceptions of autonomy and competence satisfaction in PE, the Spanish version (Zamarripa et al., 2020) of the Basic Psychological Need Satisfaction and Frustration Scale (Chen et al., 2015) will be used. Four of the six factors of these scales will be assessed, except for relatedness satisfaction and frustration in PE. Preceded by the stem "In my PE lessons...", the 16 items (four items per factor) assessing autonomy satisfaction (e.g., "I feel I have been doing what interests me"), autonomy frustration (e.g., "I feel pressured to do too many tasks"), competence satisfaction (e.g., "I feel I

can complete difficult tasks”), and competence frustration (e.g., “I feel like a failure because of the mistakes I make”) are presented. Items will be assessed using a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

PE experiences. In line with previous research (Diloy-Peña et al., 2024), students’ perceived experiences in PE classes will be assessed using the question: “What are your experiences in PE lessons like?” The response possibilities were: (1) *very bad*, (2) *bad*, (3) *neutral*, (4) *good*, and (5) *very good*.

Perceived Learning in PE. In line with previous research (Diloy-Peña et al., 2024), students’ perceptions of learning in PE will be assessed using the question: “How much do you learn in PE?” The response possibilities will be on a scale from 1 (*nothing*) to 5 (*a lot*).

Intention to Be Physically Active. Students’ perceptions of intention to participate in PA will be assessed using three items (e.g., “I intend to do active sports and/or physical activities during my leisure time in the next 5 weeks...”) of the Spanish version of the Theory of Planned Behaviour Questionnaire (Tirado-González et al., 2012). This is a 5-point Likert scale ranging from 1 (*strongly agree*) to 7 (*strongly disagree*).

Observation

Observed (De)Motivating Teaching Styles and Approaches. Before the study, two raters with expertise in PE teaching instruction and the circumplex model will be trained in how to code (de)motivating teaching styles and approaches during PE using a Spanish translation of the SIS-PE-Coder, a new observation instrument with good reliability and internal validity (Van Doren et al., 2023). Following Van Doren et al.’s (2023) procedure, two randomly selected five-minute videos will be coded to represent the beginning, middle, or end of the lesson during six meetings. Before the final meeting, each expert will independently code an entire lesson. Interobserver reliability will be determined through Cohen’s Kappa, using the following formula: $\text{agreements} / (\text{agreements} + \text{disagreements}) \times 100$.

Consistent with the teachers’ version of the SIS-PE, the SIS-PE-Coder consists of 41 items, of which four items represent the participative approach, five items the attuning approach, six items the guiding approach, five items the clarifying approach, five items the demanding approach, seven items the domineering approach, five items the abandoning approach, and five items the awaiting approach. The coder will be prompted to assess each teaching behaviour from the students’ perspective, as specified

by the statement: "If you were a student in this PE class, you would believe that the PE teacher...". Each item will be coded on a 7-point Likert scale, ranging from 0 (*does not display this behaviour*) to 6 (*perfectly displays this behaviour*). These two raters will record two classes per experimental group teacher at two different moments of the implementation phase (before the second and third quantitative measures; see Figure 1). Items will be coded at 5-minute intervals (Aelterman et al., 2013). For every lesson, interval scores will be added to create a sum score for each teaching behaviour throughout the lesson. This sum will be divided by the number of coded 5-minute intervals. Subsequently, scores for (de)motivating teaching styles and the eight approaches will be generated by averaging the scores of the individual items corresponding to each of the four styles and eight teaching approaches. The aim of the recordings will be not only to assess the fidelity of the intervention but also to provide opportunities for teachers' self-assessment, as well as co-assessment by a member of the study.

For the observational analysis recordings, various professional video cameras will be used, as well as microphones connected to both the camera and the PE teacher who will be conducting the lessons. The iMovie (IOS) programme will be used to digitise the video from the start to the end of the PE class.

Focus Groups

Two discussion groups with all PE teachers will be held throughout the study (See Figure 1). Firstly, one focus group will be held immediately after the end of the fourth session of the training programme. The main themes covered in the focus groups will be (1) the content of each session of the programme (i.e., theoretical background, design of motivational strategies in different teaching units, and implementation of different PE lessons), (2) the didactical approach (e.g., images, videos, practical examples, formative assessment, and interactive exercises) and their perception of the trainers' (de)motivating teaching style (i.e., congruent teaching), (3) perceived changes in beliefs about (de)motivating teaching styles, the satisfaction of their basic psychological needs, and (de)motivating teaching styles towards students, and (4) overall assessment of the training (e.g., innovation, practical usefulness, feasibility of the motivating strategies, intention to implement the motivating strategies, satisfaction, etc.). This last question will complement the short questionnaire completed by the PE teachers at the end of each training programme session (see above).

The second focus group will take place at the end of the intervention, coinciding with the completion of the teachers' and students' questionnaires in the post-test (T3). This will help to determine the teachers' perception of the implementation phase, as well as of the different study variables. The main themes covered in the focus groups will be (1) the follow-up of the training programme (e.g., individual and group sessions), (2) perceived changes in beliefs about (de)motivating teachers' styles, satisfaction of their basic psychological needs, (de)motivating teaching styles towards students, and job satisfaction, emotional exhaustion, and job performance.

Both focus groups will be facilitated by a female with expertise in PE teaching instruction, the SDT framework, and qualitative methodology. To encourage open communication among PE teachers, the trainers will not be present during the group discussions. Focus group sessions will start with an overview of both the aim and the procedure. The moderator will be supported by a co-moderator, who will manage logistics, record notes, and oversee the recording equipment. Furthermore, to conclude the focus group, the co-moderator will provide a summary of the primary viewpoints and will ask PE teachers whether these perceptions accurately reflect their views or whether they wish to contribute additional insights.

Focus groups will take place in a comfortable, and neutral room, lasting approximately 50 minutes. All sessions will be videotaped and transcribed to draw conclusions from the discussions.

Teachers' Training Programme and Intervention Implementation with Students

The intervention will comprise two phases in the experimental group: 1) a teacher-training phase (four face-to-face sessions and two follow-up sessions) and 2) an implementation phase where teachers will implement the strategies with the students (see Figure 1).

Teachers' Training Programme in the Experimental Group. The first part of the training programme will last four weeks, a total of eight hours. All PE teachers will participate in four weekly face-to-face group sessions, each lasting two hours, scheduled from 17:00 to 19:00. Grounded in the circumplex model, the sessions aim to increase autonomy support and structure, while reducing controlling and chaotic approaches towards students. The training will be delivered by two members of the research team who are experienced in SDT-training programmes for PE teachers.

The programme incorporates strategies from established SDT-based teacher training programmes (Aelterman et al., 2013; Cheon et al., 2020; Reeve et al., 2022;

Reeve & Cheon, 2021). For example, to lead by example (i.e., congruent teaching), trainers provided autonomy support and structure and avoided control and chaos in all the training programme sessions. It is worth noting that the pre-test values of teachers' and students' perceptions of teaching approaches will allow the design of the training programme to be tailored to the needs of the participants, particularly in the individual follow-up session.

The first two-hour face-to-face training session will unfold in a hybrid theoretical-practical workshop format. It will commence with an introductory presentation by the trainers, followed by a brief review of the objectives and contents of the training programme. The session will then transition into an autonomy-supportive exercise, where PE teachers will select a "getting-to-know-you" activity (15 min). Teachers should individually identify on a green sticky note some teaching behaviours of a good PE teacher who taught them (e.g., "they allowed us to choose some tasks") and on a red note those of a bad PE teacher (e.g., "they constantly punished us"). Then, after sticking these notes on the board, teachers will have the opportunity to read and explain their experiences to the rest of the group (15 min). This activity will be linked to the theoretical background (i.e., SDT and circumplex model) that will be used throughout this training programme. Thus, through ongoing collaboration and involvement of PE teachers (e.g., "What do you think the need for competence refers to?"), a concise overview of the SDT framework and circumplex model will be provided. This will be done using real-life examples and personal anecdotes shared by both the trainers and the teachers (30 min). Finally, teachers will be encouraged to individually design a series of generic strategies to support autonomy and provide structure, as well as to be less controlling and chaotic towards students in PE lessons (15 min). They will share these strategies with another teacher (15 min) and, finally, in pairs, with the entire group and trainers. This will lead to a collective reflection on the strategies themselves (e.g., "Why do you think this strategy might satisfy the need for autonomy?", "Could it satisfy or frustrate some other basic psychological need?") (25 min). At the end of the session, a brief explanation of the next steps and the objectives for upcoming sessions will be given to foster a positive disposition among the teachers. They will also be asked about the teaching units in their annual teaching plans that they must still teach in each of the classroom groups involved in the study (5 min).

The second two-hour face-to-face training session will involve designing motivational strategies in a practical workshop. In the first part of this session, the

previous session will be briefly reviewed, recalling theoretical background, identifying (de)motivating teaching behaviours, and reviewing the implementation in their PE lessons of the strategies proposed by the PE teachers in the last session. For this purpose, teachers will actively explain and assess the acquired learning (15 min). Next, some videos of (de)motivating teaching strategies implemented by other secondary PE teachers will be shown. The videos will be selected based on teaching behaviours that have not been detailed by the PE teachers in the previous training session (e.g., autonomy support; “provide an explanatory rationale”). Teachers should identify (de)motivating teaching behaviours depicted in the videos and consider their potential consequences on students’ basic psychological need satisfaction or frustration (25 min). Subsequently, the teaching units mentioned by the PE teachers in the previous training session will be listed. At least two of these teaching units will be chosen to design motivational strategies for small working groups (30 min). A coordinator of each group will present the different (de)motivating teaching strategies of the teaching unit and trainers, and the rest of the teachers will formatively assess the co-created strategies (30 min). Finally, one teacher from each group will be offered the opportunity to teach one of the lessons of these teaching units to their colleagues, integrating at least two strategies from each (de)motivating teaching behaviour. The other teachers in the group will assist the volunteer teacher in designing the class.

The third two-hour face-to-face training session will involve applying and receiving the strategies learned throughout the training programme in a simulated real-life situation (i.e., PE lesson) with the other participating teachers and other volunteers. One teacher from each group will teach one of the lessons of these teaching units using (de)motivating teaching behaviours (45 min per teacher). Afterwards, the trainers and the other PE teachers will provide a formative assessment of positive strengths and areas for improvement (15 min after each class). Finally, another teacher will be encouraged to implement a lesson from the teaching unit of their annual teaching plan, with the help of the research team via Google Meet, in the last session of the training programme.

The fourth face-to-face training session will continue the practical application of (de)motivating teaching strategies in a simulated real-life situation. This last session is intended to be an example for the rest of the teachers in which a wide variety of (de)motivating teaching strategies frequently appear. This last session will follow the same procedure as the previous class (45 min of class and 15 min of reflection). In the

second part of the class, a final in-depth reflection on the first part of the training programme will take place, synthesising all the key concepts covered in the initial phase of the training programme across the four sessions. Finally, teachers will receive a dossier of (de)motivating teaching behaviours organised in styles and approaches in line with the motivational behaviour change techniques identified by themselves and the trainers during the training (see the section on intervention implementation). Finally, the possibility of creating a WhatsApp group will be offered to facilitate the follow-up of the training programme. Teachers will be able to share their progress, ask questions about implementing strategies, etc.

During the implementation phase, there will be one individual and one group follow-up session of the training programme (see Figure 1) to monitor the implementation of strategies, give feedback on positive aspects and areas for improvement, and identify potential barriers or challenges encountered in the implementation of motivational strategies during this period. For the individual follow-up session, the trainers will visit each school to observe one PE class with each teacher. Subsequently, a detailed report of their teaching performance will be provided. The report will include: 1) a series of motivational strategies that the teacher used in their class, 2) a proposal of motivational strategies that the teacher could have used in their class, 3) a report of their teaching profile based on the pre-test questionnaire values, including both the teachers' self-perception and the students' perceptions, and 4) advice and motivational strategies to improve their teaching profile in that specific class. For the group follow-up session, the objective will be to analyse each teacher's videos (taken from the first observational measure). The trainers will thoroughly review each video to extract clips showing each teacher using motivating and/or demotivating strategies. After each strategy is presented, a brief discussion will be held with the other teachers to identify strengths and suggestions for possible improvement of these strategies. These follow-up sessions will be individualised and adapted to the needs of each teacher.

Intervention Implementation with Students in the Experimental Group. It should be noted that, although teachers will begin to apply some of the (de)motivating teaching styles and approaches from the first day they attend the training programme, they will be implemented with greater variety, frequency, and intensity after the first part of the training (first four face-to-face sessions). The implementation phase will therefore last approximately five months, from January to the end of May. The training

programme received by PE teachers will focus on the motivational strategies proposed by Ahmadi et al. (2023). Teachers will be encouraged to implement as many motivational behaviour change techniques as possible in variety, frequency, and intensity in each PE class.

Control group. Control group teachers will not initially receive the training programme and, as a result, will not intentionally implement any motivational strategy. They will only complete the questionnaires at the same times as experimental group teachers (See Figure 1). Control group teachers will receive the training programme after the last study measurement, as well as an extensive final report on their teaching profile and a series of motivational strategies aimed at enhancing their (de)motivating teaching style.

Table 1.

Summary of the programme training sessions.

Face-to-face session 1	Face-to-face session 2	Face-to-face session 3	Face-to-face session 4	Follow-up session 1	Follow-up session 2
The entire group of PE teachers	The entire group of PE teachers	The entire group of PE teachers	The entire group of PE teachers	Individual	The entire group of PE teachers
1. Presentation and getting-to-know-you activity 2. Teaching behaviours of good/bad teachers. 3. Explanation of the theoretical backgrounds. 4. Design of motivational strategies in PE lessons.	1. Summary of the previous lesson 2. Identifying (de)motivating teaching behaviours with real videos. 3. Design of specific motivational strategies in different teaching units	1. Application of the motivational strategies in two PE lessons of a simulated real-life situation and subsequent reflection.	1. Application of the motivational strategies in one PE lesson of a simulated real-life situation and subsequent reflection. 2. Summary of the key points of the four previous sessions	1. Observation of the PE teachers' real classes and subsequent constructive feedback.	1. Observation of the PE teachers' real classes and subsequent constructive feedback.

Analysis Plan

Quantitative Analyses

Firstly, the effects of the four sessions of the training programme on the study variables assessed in teachers will be examined. The overall mean for each of the 11 variables perceived by PE teachers about the quality of the training programme (e.g., interaction, innovation, interest, intelligibility, etc.) will also be calculated, representing the mean across the different sessions. Repeated-measures analysis of variance

(ANOVA) will be used to assess PE teachers' global appreciation of the 11 variables related to the quality of the training programme (e.g., interaction, innovation, interest, intelligibility, etc.) across the training sessions (i.e., within-subject analyses). Accordingly, each training session will be introduced as an independent variable (i.e., within-subject factor), and repeated measures of the PE teacher-related variables will be entered sequentially as dependent variables.

Secondly, the effects of the intervention implementation in PE lessons on the study variables for both teachers and students will also be examined. Levene and Kolmogorov–Smirnov tests will ensure the equality of variances and normal data distribution, respectively ($p > .05$). Cronbach's coefficient will be calculated for each study variable across the three measurements. To examine the effects of the intervention on the study variables, a 3 x 2 (Time x Condition) repeated-measures multivariate analysis of covariance (MANCOVA) will be performed for both teachers and students. Age, gender, teaching experience, type of school (public or private), and school location (rural or urban) will be introduced as covariates among teachers, whereas age, gender, and school grade will be introduced as covariates among students. Subsequently, to examine intragender differences of the intervention on study variables, a 3 x 2 x 2 (Time x Condition x Gender) repeated-measures MANCOVA will be performed for both teachers and students. The same covariates will be entered as in the previous analysis, excluding gender. Multiple paired t-tests with Bonferroni correction will be calculated to determine between-group (i.e., experimental-control group) and within-group (i.e., pre-post) differences. Cohen's criteria will be used as indicators of small (.01), moderate (.06), and large (.14) effect sizes (Field, 2017). All statistical analyses will be conducted using IBM SPSS Statistics v.25.0. Finally, a longitudinal structural equation model will be used to analyse the predictive relationships between the study variables, allowing for the observation of potential differences at the three specific times (i.e., pre-test, intermediate-test, and post-test) when data are collected.

Qualitative Analyses

Concerning the qualitative data, both focus groups will be transcribed and analysed using NVivo Version 11.0 software to organise and classify data efficiently. The data will be analysed using a thematic analysis following the Braun and Clarke (2019) phases. First, three researchers will review all the transcriptions independently to gain familiarity with the data. Second, these researchers will select text fragments related to teachers' perceptions of the effects of the training programme and subsequent

implementation with students. Finally, after the code review, the final themes and subthemes containing the relevant meanings extracted from the dataset will be further refined. It is expected that a deductive thematic analysis underpinned by the circumplex approach and SDT will be conducted because most of the questions are related to these frameworks. The other two researchers will supervise and share their viewpoints and interpretations to facilitate agreement during the data analysis.

Discussion

One of the challenges teachers and researchers face is the difficulty of replicating interventions that have shown promising results. This endeavour is often hampered by inadequate reporting of intervention protocols and content. A detailed description of the training programme and the subsequent intervention may facilitate scalability in other areas, countries, and contexts. To fill this gap, the present study aims to comprehensively describe the protocol of a motivational training programme, based on the circumplex model, aimed at improving the autonomy-supportive and structuring teaching approaches and minimising controlling and chaotic styles among PE teachers.

This study will provide a unique contribution to knowledge in ten key areas: (1) it will be the first motivational training programme based on the recent circumplex model, due to the recent and innovative nature of this approach, and the eight teaching approaches proposed by the circumplex model will be assessed using real-life educational situations through the SIS-PE instrument; (2) the quality of the face-to-face training sessions and follow-up sessions of the training programme will be examined through short questionnaires at the end of each class, as well as through a focus group with all the PE teachers; (3) the effects of the intervention on a wide range of study variables will be evaluated using a mixed-method approach (i.e., questionnaires and focus groups) in both teachers and students; (4) the effects of the intervention on male and female students and teachers will be examined; (5) not only a post-test, but also an intermediate measure will be used to examine how the study variables vary throughout the programme; (6) the training programme will not only take place before the implementation of the intervention, but also during the intervention; (7) the training programme will include one individual and one group follow-up session in which constructive feedback will be provided, as well as an individualised report; (8) promising strategies that have been shown to be effective in previous SDT-training programmes (e.g., congruent style, brief theoretical part, real videos of PE teachers, microteaching, co-creation of teaching strategies, etc.) will be used; (9) the assessment

of intervention fidelity through a new validated observational instrument in line with the circumplex model (i.e., SIS-PE-Coder) will be used; (10) motivational behaviour change techniques provided by Ahmadi et al. (2023) will be used during the intervention implementation to determine which behaviour change techniques are attributed to the intervention effects.

Likewise, some of the expected results for both teachers and students about the development of this training programme will be presented according to the three hypotheses. Regarding the first hypothesis, as promising strategies used in previous SDT-training programmes will be used (e.g., Aelterman et al., 2013), experimental group teachers will perceive the training programme positively (e.g., innovation, practical usefulness, feasibility of the motivating strategies, intention to implement the motivating strategies, satisfaction, etc.). Teachers' feedback will help to modify the training programme before it is disseminated to other areas, countries or contexts. This could enhance the training programme's acceptability, sustainability, and scalability.

Concerning the second hypothesis, experimental female and male school teachers are expected to perceive improvements in several antecedents, autonomy and competence satisfaction/frustration at work, (de)motivating teaching styles/approaches, and (mal)adaptive outcomes at least at the end of the intervention implementation with students. According to SDT, teachers are expected to improve malleable antecedents such as (de)motivating teaching style beliefs due to scientific evidence or viewing videos of real classrooms of PE teachers. According to SDT, improving the different antecedents could, in turn, improve autonomy and competence satisfaction/frustration at work (Aelterman et al., 2016; Matosic et al., 2016). The large repertoire of teaching strategies learned during the training programme may also enhance teachers' autonomy and competence satisfaction at work, as well as reduce their autonomy and competence frustration at work, as they will feel they have more resources to cope with their teaching. Finally, according to previous studies in PE teachers, autonomy and competence satisfaction at work could favour greater job satisfaction and job performance (Abós, Haerens, et al., 2018), as well as greater use of autonomy-supportive (i.e., participative and attuning) and structuring styles (i.e., guiding and clarifying) (Burgueño, Abós, et al., 2024; García-Cazorla, García-González, et al., 2024). Conversely, reduction of autonomy and competence frustration at work could favour lower emotional exhaustion (Abós, Haerens, et al., 2018), as well as a lower use of controlling (i.e., demanding and domineering approaches) and chaotic styles (i.e.,

abandoning and awaiting approaches) toward students (Burgueño, Abós, et al., 2024; García-Cazorla, García-González, et al., 2024).

Finally, regarding the third hypothesis, it is expected that both boys and girls from the experimental groups will perceive improvements in (de)motivating teaching styles/approaches because of the implementation of strategies by their PE teachers over approximately five months (Vasconcellos et al., 2020). According to SDT, when students perceive that their PE teachers use autonomy support and structure, they will likely feel autonomy and competence satisfaction. Conversely, if they perceive controlling and chaotic teaching styles, they will likely feel autonomy and competence frustration (Vasconcellos et al., 2020). Finally, it is expected that through the improvement of need-based experiences, students will achieve improvements in affective (i.e., PE experiences), cognitive (i.e., learning in PE), and behavioural (i.e., intention to be physically active) outcomes (Vasconcellos et al., 2020).

Limitations

Some of the limitations in the development of the teacher training programme are as follows. Firstly, the training duration should be kept brief to ensure that PE teachers grasp and internalise the motivational strategies, enabling them to effectively integrate these techniques into their PE classes. Acquiring new knowledge requires dedicating time to learn and assimilate, as well as opportunities to practice and self-and co-assess. Nevertheless, an excessively lengthy training programme might discourage PE teachers' participation. In the scientific literature, these programmes typically range from three to 12 hours, but there is no consensus regarding the ideal duration. If all the teachers are willing to continue the training programme, slightly increasing the number of hours could be considered. Secondly, observation will be used twice to ensure intervention fidelity and provide constructive feedback to teachers during the intervention but will not be used as a complementary measure of students' and teachers' perception of (de)motivating teaching styles in the three measures of the study due to lack of human resources. Thirdly, teachers' perceptions of their beliefs about (de)motivating teaching styles will not be assessed by means of questionnaires due to their length, as well as the absence of validated instruments of the controlling and chaotic styles. Additionally, relatedness satisfaction and frustration at work will not be assessed because the training programme will not target teachers within the same school. Additionally, teachers' perceptions of depersonalisation and reduced personal accomplishment (i.e., burnout factors) will not be assessed using questionnaires due to

their length. However, all these variables will be assessed through the focus groups to obtain more information on the effects of the training programme and the subsequent intervention carried out. Finally, students' perceptions of relatedness satisfaction and frustration in PE will not be assessed employing questionnaires due to their length and because the teacher training programme was based on the circumplex model, which does not address the need for relatedness. As a final limitation, it is very likely that a post-intervention follow-up measure cannot be carried out the following academic year because in Spain, it is very common for teachers to change schools every year. Therefore, it will only be possible to assess students' perception of the study variables if they have the same teacher. Similarly, the perception of (de)motivating teaching style might change with different classroom groups.

Conclusions

The present study presents a comprehensive overview of the protocol for a training programme designed for in-service PE teachers, based on the circumplex model, to maximise transparency and replicability. We hope that the motivational training programme will help PE teachers support autonomy and structure while minimising the use of controlling and chaotic teaching styles. This, in turn, may lead to an improvement in motivational-related variables and adaptive outcomes both in students and teachers. If the results are promising, this study can drive the professional development of motivational training programmes for in-service PE teachers.

4.4. Estudio 4: A Circumplex Model-Based Intervention for Physical Education Teachers: A Randomised Control Trial on Teacher and Student Motivational Processes and Outcomes

Situación actual: Sometido. Primera ronda de revisión por pares.

Revista: Teaching and Teacher Education

Factor de impacto (cuartil): 4.0 (Q1)

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Abstract

In recent years, there has been growing concern about developing effective training programmes for Physical Education (PE) teachers, given the significant influence they have within the educational context. In response to this need, MotivaDosEF (in English MotivaTedPE) was created as a comprehensive and global training programme for PE teachers, designed to align with both Self-Determination Theory (SDT) and the circumplex model, following the scientific advancements of recent years. To date, no existing programme has fully addressed all the teaching approaches outlined in the circumplex model (i.e., participative, attuning, guiding, clarifying, demanding, domineering, abandoning, and awaiting). Therefore, the main objective of this study was to examine the effects of MotivaDosEF on teaching style, the motivational process, and various PE-related outcomes from both the teachers' and students' perspectives.

This quasi-experimental study followed a randomised controlled trial design with a mixed-method approach. The sample consisted of 17 PE teachers (eight in the experimental group and nine in the control group) and their students (813 in total) from various secondary schools. PE teachers (and their students) were randomly assigned to either the experimental or control group. The study's main findings indicated that students in the experimental group perceive an increased use of autonomy-supportive and structuring approaches by their teachers, along with higher satisfaction of their basic psychological needs (BPN), greater physical activity (PA) intention, improved quality of their experiences in PE, and enhanced perceived learning in PE. At the same time, students perceive a decreased use of controlling approaches by their teachers, along with lower frustration of their BPN. Additionally, PE teachers in the experimental group reported a significant increase of BPN satisfaction and job performance, along with an increase in the use of participative approach, and a reduction in the use of demanding, domineering, and abandoning approaches, as well as a decrease in autonomy frustration. Therefore, MotivaDosEF has proven to be an effective programme for improving the motivational teaching style of PE teachers, as well as enhancing the motivational process for both teachers and students, ultimately leading to better outcomes for both. This training programme underscores the importance of developing comprehensive and holistic programmes that not only aim to enhance motivational teaching approaches but also actively work to reduce demotivating ones, ensuring truly significant and lasting benefits.

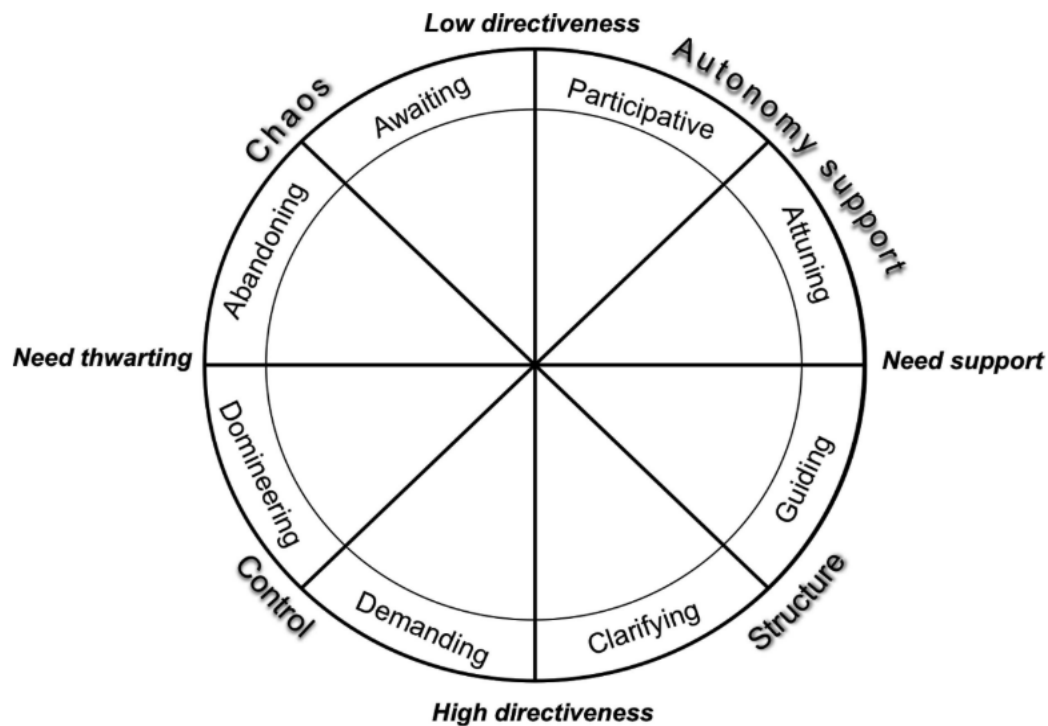
Introduction

In recent years, there has been a growing concern for physical education (PE) teachers to enhance their performance to achieve better outcomes for both their students and themselves. Various training programmes based on Self-Determination Theory (SDT; Ryan & Deci, 2017) have recently demonstrated that teachers who adopt more autonomy-supportive and less controlling practices foster improved motivational outcomes for their students (e.g., Reeve & Cheon, 2024). Cheon et al. (2020) further revealed that increasing autonomy support and structure in PE enhances students' engagement, skill development, anticipated performance, and intentions to exercise, while also benefiting teachers through increased teaching efficacy and job satisfaction.

In this context, a new theoretical model has recently emerged, named circumplex model, offering a detailed, precise, and fine-grained way to analyse the different (de)motivating teaching styles and approaches that a teacher can use in their lessons (Aelterman et al., 2019). However, due to recent emergence of this model, no intervention study has yet created a training programme for teachers that links all the teaching styles and approaches of the circumplex model. Therefore, the present study aims to contribute to the existing scientific evidence by examining the effects of a circumplex model-based training (i.e., MotivaDosEF; in English MotivaTedPE; García-Cazorla, Sevil-Serrano, et al., 2024) on the motivational processes and different PE outcomes of both students (e.g., learning perceived, intention to PA, and quality of experiences in PE) and PE teachers (e.g., job satisfaction, job performance, and emotional exhaustion).

A Comprehensive Overview of the Circumplex Model

Rooted in SDT (Ryan & Deci, 2017), the circumplex model (see Figure 1) provides an in-depth view of four teaching styles (i.e., autonomy support, structure, control, and chaos) and eight teaching approaches (i.e., participative, attuning, guiding, clarifying, demanding, domineering, abandoning, awaiting) that a PE teacher can employ in their lessons (Aelterman et al., 2019; Burgueño, Abós et al., 2024; Escrivá-Boulley et al., 2021). As illustrated in Figure 1, these teaching styles and approaches are organised in a circular structure along two axes: the degree to which teachers support or thwart students' basic psychological needs (BPN) (y-axis) and the extent to which teachers take the lead in learning interactions (x-axis).

Figure 1.*Graphic of the Circumplex model.*

Note. Graphical representation taken from Aelterman et al. (2019).

Based on the intersection of these two axes, autonomy support and structure are classified as motivating styles, as both are considered need-supportive. Autonomy support is characterised by low directiveness, while structure is marked by high directiveness. Autonomy-supportive PE teachers display openness and flexibility to accommodate their students' preferences and interests (Vansteenkiste et al., 2019). Specifically, these teachers empower students by involving them in decision-making regarding their learning (i.e., participative approach) and/or by emphasising the relevance of tasks, aligning them with students' interests and validating their perspectives (i.e., attuning approach) (Burgueño, Abós, et al., 2024). In contrast, structured PE teachers adopt progress-oriented and process-focused attitudes, considering each student's ability levels and needs (Vansteenkiste et al., 2019). They instill confidence in students' abilities by providing useful and tailored information and feedback (i.e., guiding approach) and/or by clearly communicating learning goals and expectations while consistently monitoring their progress (i.e., clarifying approach) (Burgueño, Abós, et al., 2024).

Conversely, control and chaos are categorised as demotivating styles, as both are defined as need-thwarting. Control is defined by high directiveness, whereas chaos exhibits low directiveness. Controlling PE teachers pressure students to think, feel, and behave in specific ways (Vansteenkiste et al., 2019). They may adopt a tunnel-vision approach, prioritizing their agenda and methods for task completion by using explicit behaviour-focused strategies such as strict commands and coercive language (i.e., demanding approach) and/or manipulative person-targeted strategies like guilt induction and public shaming (i.e., domineering approach) (Burgueño, Abós, et al., 2024). Finally, chaos refers to PE teachers who adopt a laissez-faire perspective, marked by unpredictable and inconsistent behaviour (Vansteenkiste et al., 2019). Chaotic PE teachers might leave students to their own devices, giving up after repeated attempts to intervene (i.e., abandoning approach), or waiting to see how situations unfold when direction is needed (i.e., awaiting approach) (Escriba-Boulley et al., 2021).

The Key Role of Basic Psychological Needs in Teaching based on Self Determination Theory

The importance of BPN of autonomy (i.e., to be self-directed in learning), competence (i.e., to feel effective and capable), and relatedness (i.e., to feel connected to others) for both students and PE teachers has been extensively demonstrated (Abós, Haerens, et al., 2018; Vasconcellos et al., 2020). These BPN share a common ground that significantly impacts the teaching (teachers) and learning (students) process, particularly through (de)motivating teaching styles and approaches. Recent circumplex model-based research has shown that when PE teachers' BPN are satisfied at work, they are more likely to employ autonomy-supportive (i.e., participative and attuning) and structuring (i.e., guiding, and clarifying) approaches (García-Cazorla, García-González, et al., 2024). Conversely, the frustration of PE teachers' BPN at work has been positively related to controlling (i.e., demanding and domineering) and chaotic (i.e., abandoning and awaiting) approaches, while negatively impacting autonomy-supportive (i.e., participative and attuning) practices (García-Cazorla, García-González, et al., 2024). Moreover, SDT-based research (Slemp et al., 2020) indicates that teachers' BPN satisfaction is positively associated with various adaptive job-related outcomes (e.g., well-being, job satisfaction, engagement) and need-supportive teaching behaviours towards students. In contrast, teachers' BPN frustration is linked to maladaptive PE teachers' outcomes (e.g., distress, burnout) and need-thwarting teaching behaviours towards students (Slemp et al., 2020).

The case of the motivational process of students was illustrated by Burgueño, Abós, et al. (2024), who indicate a positive correlation between students' perceptions of autonomy-supportive (i.e., participative and attuning) and structuring (i.e., guiding and clarifying) styles from PE teachers with students' BPN satisfaction. Notably, the clarifying approach is also negatively correlated with students' BPN frustration. Similarly, Diloy-Peña et al. (2024) observed that students who perceived autonomy-supportive and structuring styles from their teachers, exhibited higher levels of positive PE experiences, perceived learning in PE, and intentions to engage in physical activity (PA). Conversely, Burgueño, Abós, et al. (2024) established that controlling (i.e., demanding and domineering approaches) and chaotic (i.e., abandoning and awaiting approaches) styles are positively correlated with students' BPN frustration. It is also noteworthy that the aforementioned study demonstrated a negative correlation between the use of domineering and abandoning approaches with students' BPN satisfaction. Consequently, given the substantial benefits for students, there has been an increase in SDT-based training programmes aimed at enhancing the motivating teaching styles of PE teachers.

Previous SDT-Based Training Programmes for PE Teachers

Previous SDT-based training programmes have predominantly focused on the implementation of autonomy-supportive strategies (e.g., Schneider et al., 2020; Tilga et al., 2021). Nevertheless, some have also incorporated elements of alternative motivating teaching styles, providing structure in an autonomy-supportive manner (Cheon et al., 2020) or reducing controlling behaviours (Reeve & Cheon, 2024). Moreover, although one SDT-based training programme (Cheon et al., 2020) has demonstrated the value of such programmes in enhancing teachers' teaching styles and their impact on students, as well as on teachers' work-related outcomes (e.g., teaching efficacy, intrinsic goals, job satisfaction, harmonious passion, and relationship satisfaction), the majority of SDT-based training programmes have concentrated exclusively on examining students' perceptions and effects, overlooking the potential benefits they can have on teachers.

Recent research, however, has expanded the focus of these programmes. Three studies have been conducted within the educational field have investigated the impact of circumplex model-based training programmes on (de)motivating teaching styles (Cheon et al., 2020; Conesa et al., 2023; Jang et al., 2023). However, it should be noted that none of these studies have specifically addressed the effects of all eight teaching approaches outlined by the circumplex model. Given that teachers often combine need-

supportive and need-thwarting approaches within their teaching (Burgueño, García-González, et al., 2024; García-González et al., 2023), it is crucial for training programmes to focus not only on promoting motivating behaviors but also on actively reducing detrimental ones. Moreover, since each PE teacher exhibits a unique pedagogical profile (Burgueño, García-González, et al., 2024), training programmes should account for these individual differences. To support this, the use of observational instruments to gather data on the different teaching profiles of PE instructors seems essential to provide constructive and personalised feedback based on video analysis (Van Doren et al., 2023).

To address the complexity of PE teaching profiles, a recent SDT-based training programme (Reeve & Cheon, 2024) underscored the importance of employing diverse methodologies to achieve superior outcomes. These methodologies include the combination of demonstrational examples (Assor et al., 2018), how-to video modeling (Escriva-Boulley et al., 2018), training and practice sessions (Zhang et al., 2021), lesson planning (Abula et al., 2020), role-playing exercises (Zhang et al., 2021), teaching simulations (Levin, 2024), problem-solving activities (Ulstad et al., 2018), one-on-one guidance and mentoring (Escriva-Boulley et al., 2018), and group discussions with peer teachers (Abula et al., 2020) as well as with students (Kaplan & Assor, 2012). Additionally, adopting a congruent SDT-based approach where trainers use motivating teaching styles and avoid those that may be demotivating has been met with positive responses from PE teachers. This approach enables them to observe real-life examples of effectively implementing these strategies (Aelterman et al., 2013).

Finally, it is important to consider that the effectiveness of these (de)motivating teaching styles could be influenced by gender, as prior SDT-based research suggests potential differences in how male and female students, as well as male and female teachers, perceive (de)motivating teaching behaviors (García-Cazorla, García-González, et al., 2024; White et al., 2021). Therefore, controlling for gender is essential to ensure that any potential gender-related variations are accounted for and that the intervention is equitable across both genders.

The Present Study

Following the guidelines of the “MotivaDosEF” intervention protocol (García-Cazorla, Sevil-Serrano, et al., 2024) and considering aforementioned points, this study aims to examine the effects of this circumplex model-based training programme for PE teachers on (de)motivating teaching styles and approaches from the perspectives of

students and teachers. Additionally, the study will assess the motivational processes of both students and teachers, along with various other PE (students) and work-related (teachers) outcomes for both groups. Likewise, the (de)motivating teaching approaches of the PE teachers in the experimental group will be observed to examine the fidelity of the training programme. Regarding different SDT-training programmes that have examined the students' perspectives (e.g., Aelterman et al., 2013; Cheon et al., 2020), even though they do not cover all teaching approaches of the circumplex model, the first hypothesis suggests that both male and female students in the experimental group will perceive improvements in their PE teachers' motivating teaching styles and approaches. They are also expected to perceive a reduction in demotivating styles, an increase in autonomy and competence satisfaction in PE, a decrease in frustration of their needs, and improvements in their intention to be physically active, the quality of their experiences, and their perceived learning (H1). Based on previous SDT training programmes that analyze the perceptions of PE teachers (e.g., Cheon et al., 2020), the second hypothesis posits that PE teachers in the experimental group will notice improvements in their autonomy and competence satisfaction at work. Additionally, they are expected to experience a reduction in BPN frustration, an increased use of motivating teaching styles, a decreased use of demotivating styles, and improvements in job satisfaction, job performance, and reductions in emotional exhaustion (H2). Finally, following the intervention protocol (García-Cazorla, Sevil-Serrano, et al., 2024), we expect that the observational results of (de)motivating teaching approaches will support the quantitative findings, reinforcing the fidelity of the intervention in the use of (de)motivating teaching approaches (H3). If the results align with our expectations, the MotivaDosEF training programme for PE teachers could be considered for inclusion in both Physical Education Teaching Education (PETE) programmes and continuous development teaching programmes. This would not only enhance teachers' behaviors in the classroom but also improve the motivational processes for both students and teachers, ultimately leading to better outcomes in PE.

Method

Design, Participants, and Procedures

This quasi-experimental study followed a randomised controlled trial design with a mixed-method approach. PE teachers (and their students) were randomly assigned to either the experimental or the control group, according to the guidelines outlined in the intervention protocol (García-Cazorla, Sevil-Serrano, et al., 2024). The

study adhered to a recruitment protocol to identify and include eligible PE teachers (García-Cazorla, Sevil-Serrano, et al., 2024).

The sample consisted of 17 PE teachers (eight in the experimental group and nine in the control group) and their students (813 in total) from various secondary schools. The eight experimental PE teachers ($M_{age} = 31$; $SD = 7.15$; 100% male) had varying years of teaching experience ($M_{experience} = 6.00$; $SD = 6.53$), and all employed in public schools. These experimental PE teachers instructed a total of 336 students ($M_{age} = 14.48$; $SD = 1.29$; 46.7% male) across different secondary grades. The nine control PE teachers ($M_{age} = 31.22$; $SD = 3.46$; 77.8% male) also had varying levels of teaching experience ($M_{experience} = 3.78$; $SD = 2.17$), and 77.8% in public schools. These control group teachers were responsible for 477 students ($M_{age} = 14.91$; $SD = 1.20$; 47.6% male) across different secondary grades.

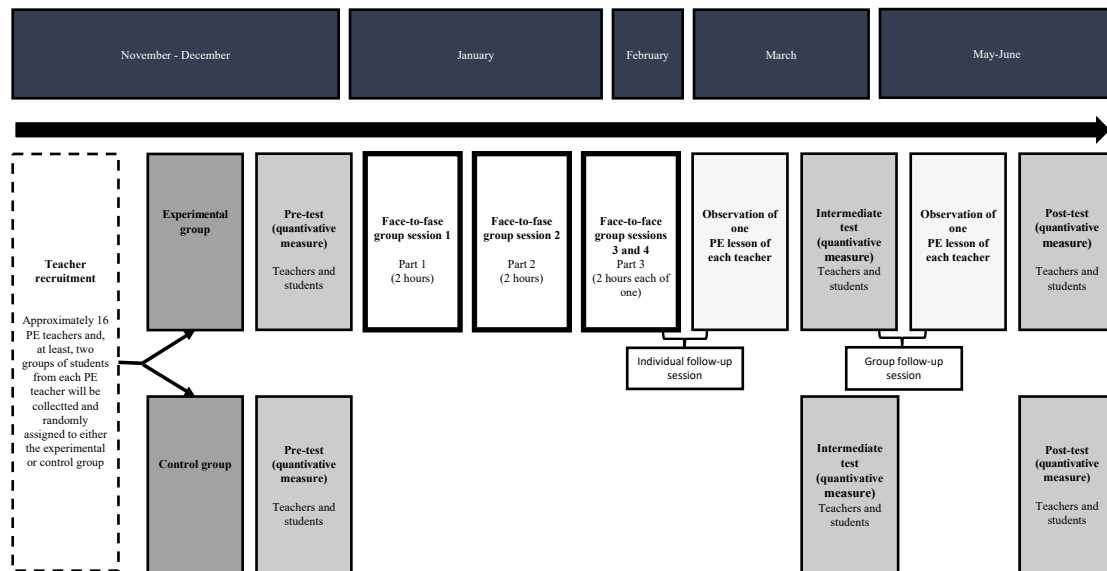
The study was conducted in a northeastern region of Spain, where secondary students attend two 50-minute, mixed-gender PE sessions per week. In this context, PE teachers are required to teach between 18 and 24 hours per week.

The intervention was conducted in two phases, as illustrated in Figure 2. The first phase consisted of teacher training, while the second phase involved implementing the intervention with students. During the implementation phase, both individual and group face-to-face sessions were conducted to reinforce the training process. Additionally, a variety of measures (quantitative and observational) were taken to teachers and students before (T1), during (T2), and at the end of the intervention programme (T3) (for further details, see Figure 2). Prior to data collection, informed consent was obtained from PE teachers, the schools, and students' families. PE teachers completed the questionnaires online (Google Forms), as this format was chosen based on their preferences expressed during the preliminary meetings held before the programme. In the case of students, these questionnaires were filled out in a quiet classroom setting using either paper-and-pencil format or Google Forms, depending on each school's protocol. To avoid response bias, the PE teachers were not present during the questionnaire sessions. Instead, a member of the research team was available with any questions they had. The training programme began in the second academic term of the academic year (i.e., January), allowing time for teachers and students to become familiar with each other. This extended period was essential to assess the teachers' perceptions of (de)motivating teaching approaches and other study variables. The study

received ethical approval from the Ethics Committee of the University of Extremadura (code: 153/2022) and all procedures adhered to the Declaration of Helsinki.

Figure 2.

Characteristics of the training programme MotivaDosEF and timeline for data collection.



Note. *The variables assessed in PE teachers and students are detailed in the corresponding section; **the training programme has two follow-up sessions (individual and group).

Measures

Students' Self-Reported Variables

Students' Socio-Demographic Variables. Students self-reported their age, gender, and school grade level.

Students' Perceptions of (De)motivating Teaching Styles and Approaches. To assess students' perceptions of (de)motivating teaching approaches of their PE teachers, the Spanish version of students of the Situations-in-School Questionnaire in Physical Education (SIS-PE; Burgueño, Abós et al., 2024) was used. The SIS-PE includes 12 typical teaching situations each consisting of four items, resulting in a total of 48 items. Autonomy-supportive items are categorised into participative (four items) and attuning (eight items) approaches. Structure items are operationalised into guiding (seven items) and clarifying (five items) approaches. Control items are divided into demanding (seven items) and domineering (five items) approaches. Chaos items are operationalised into abandoning (eight items) and awaiting (four items) approaches. For example, this opening phrase "At the beginning of the school year, your PE teacher proposes the class

rules/norms...” is followed by four items: “He/she announces the expectations and necessary rules for good cooperation (clarifying)”, “He/she doesn't overly focus on enforcing rules; instead, intervenes only when issues arise (awaiting)”, “He/she establishes the norms that you are expected to follow, and also lists the sanctions or punishments for non-compliance (demanding)”, or “He/she invites you to suggest a set of rules or norms that will help everyone feel comfortable in class (participative)”. Students’ perceptions of their teacher’s (de)motivating teaching styles may vary depending on the teacher. Therefore, students must answer the questionnaire considering specifically their PE teacher. Students’ responses were scored on a 7-point Likert scale ranging from 1 (*Does not describe my PE teacher*) to 7 (*Describes my PE teacher perfectly*). McDonald’s omega for (de)motivating teaching approaches ranged from .64 to .83 (T1), .66 to .85 (T2), and .69 to .85 (T3).

Students’ Autonomy and Competence Satisfaction and Frustration in PE. To assess students’ perceptions of autonomy and competence satisfaction and frustration in PE, the Spanish version (Zamarripa et al., 2020) of the BPN Satisfaction and Frustration Scale (Chen et al., 2015) was used. Each scale item, introduced by “In my PE lessons...”, consist of 16 items (four per factor) that measure autonomy satisfaction (e.g., “I feel I have been doing what interests me”), autonomy frustration (e.g., “I feel pressured to do too many tasks”), competence satisfaction (e.g., “I feel I can complete difficult tasks”), and competence frustration (e.g., “I feel like a failure because of the mistakes I make”). Items were rated on a 5-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). McDonald’s omega for the satisfaction and frustration of the BPN were .77 and .84, respectively (T1), .81 and .86, respectively (T2), and .82 and .86, respectively (T3).

Students’ Intention to be Physically Active. To assess the students’ perceptions of their intention to participate in PA, three items (e.g., “I intend to do active sports and/or physical activities during my leisure time in the next 5 weeks...”) from the Spanish version of the Theory of Planned Behaviour Questionnaire (Tirado-González et al., 2012) were used. This is a 5-point Likert scale ranging from 1 (*strongly agree*) to 7 (*strongly disagree*). McDonald’s omega for the intention to be physically active were .95 (T1), .95 (T2), and .94 (T3).

Students’ PE experiences. To assess the students’ perceived experiences in PE classes, in line with previous research (Diloy-Peña et al., 2024), the question: “How are

your experiences in PE lessons like?” was used. The response possibilities were: 1 (*very bad*), 2 (*bad*), 3 (*neutral*), 4 (*good*), and 5 (*very good*).

Students’ Perceived Learning in PE. To assess the students’ perceptions of learning in PE, in line with previous research (Diloy-Peña et al., 2024), the question: “How much do you learn in PE?” was used. The response options were on a scale from 1 (*nothing*) to 5 (*a lot*).

PE Teachers’ Self-Reported Variables

PE Teachers’ Socio-Demographic Variables. PE teachers self-reported their age, gender, teaching experience, and school location (rural or urban).

PE Teachers’ (De)motivating Teaching Styles and Approaches. To assess self-reported (de)motivating teaching styles toward students, the Spanish version of the Situations-in-School Questionnaire in Physical Education (SIS-PE; Burgueño, Abós, et al., 2024) was used. The only difference between this instrument and the students’ version is the sentence structure, which is framed from the teachers’ perspective (e.g., “You invite to suggest a set of norms or rules”) (for further detail, see Burgueño, Abós et al., 2024). Teachers’ perceptions of their(de)motivating teaching styles may vary depending on the classroom group. Therefore, teachers must answer the questionnaire considering the specific groups of students selected for the study. McDonald’s omega for (de)motivating teaching approaches ranged from .65 to .78 (T1), .63 to .80 (T2), and .63 to .76 (T3).

PE teachers’ Autonomy and Competence Satisfaction and Frustration at Work. To assess PE teachers’ perceptions of autonomy and competence satisfaction and frustration at work, the Spanish version of the BPN at Work Scale for in-service teachers (Abós, Sevil-Serrano et al., 2018) and the BPN Satisfaction and Frustration Scale (Chen et al., 2015) was used, respectively. Each scale begins with the stem “In my role as a PE teacher...” and measures autonomy satisfaction (e.g., “My job allows me to make decisions”), autonomy frustration (e.g., “I feel obligated to do most tasks in my job”), competence satisfaction (e.g., “I feel capable of performing my job effectively”), and competence frustration (e.g., “I doubt my ability to perform my job well”). Teachers’ responses were scored on a 5-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). McDonald’s omega for the satisfaction and frustration of the BPN ranged from .70 to .79, respectively (T1), .73 to .92, respectively (T2), and .86 to .94 (T3), respectively.

PE Teachers' Job Performance. To assess teachers' perceptions of their professional performance the following sentence was used: "Rate your satisfaction with your professional performance this academic year", which has been used previously in other studies (Barrick et al., 2002) was used. Teachers' responses were provided on a 9-point Likert scale, ranging from 1 (*non-existent*) to 9 (*excellent*).

PE Teachers' Job Satisfaction at Work. To assess teachers' perceptions of job satisfaction at work the Spanish translation (Abós et al., 2019) of the Teacher Job Satisfaction Scale (TJSS; Skaalvik & Skaalvik, 2011) was used. This four-item scale contains a single factor (e.g., "I enjoy working as a teacher"). Teachers' responses were recorded on a 6-point Likert scale ranging from 1 (*strongly disagree*) to 6 (*strongly agree*). McDonald's omega for the job satisfaction at work were .84 (T1), .88 (T2), and .90 (T3).

PE Teachers' Emotional Exhaustion at Work. To assess teachers' emotional exhaustion the Spanish version of the Maslach Burnout Inventory-General Survey (Gil-Monte, 2002) was used. In line with other studies on PE teachers (Richards et al., 2019), only the five items assessing the exhaustion factor will be used in the present study (e.g., "I feel burned out from my work"). Teachers' responses were reported on a 7-point Likert scale, ranging from 0 (*never*) to 6 (*every day*). McDonald's omega for the emotional exhaustion at work were .92 (T1), .94 (T2), and .90 (T3).

Fidelity of the Training Programme

To verify that the PE teachers in the experimental group applied the strategies aimed at promoting motivating teaching approaches and reducing demotivating teaching approaches after the intervention, in addition to the quantitative measures taken at T2 and T3, two sessions of each teacher were recorded. These recordings were conducted simultaneously with the T2 and T3 quantitative assessments. In these recordings, the (de)motivating teaching approaches used by the teachers during actual PE classes were observed. To assess the observational measure, a Spanish translation of the SIS-PE-Coder (Van Doren et al., 2023) was used. Specific details can be found in the protocol study (García-Cazorla, Sevil-Serrano et al., 2024) or the validation instrument (Van Doren et al., 2023). A Cohen's kappa value of 0.796 indicated a good level of agreement between observers. McDonald's omega for the (de)motivating teaching approaches ranged from .53 to .85 (T2), and from .62 to .89 (T3).

“MotivaDosEF”: A Circumplex Model-Based Training Programme

The specific characteristics and components of the training programme are reported in the intervention protocol (García-Cazorla, Sevil-Serrano, et al., 2024). It is also noteworthy that the intervention programme incorporates strategies derived from established SDT-based teacher training programmes (Aelterman et al., 2013; Cheon et al., 2020; Reeve et al., 2022; Reeve & Cheon, 2021). For instance, the trainers adopted an SDT-consistent style, offering autonomy support and structure while avoiding control and chaos throughout all the training sessions.

In summary, the training programme comprised four face-to-face training sessions, each lasting two hours, and two follow-up sessions: one individual session (two hours) and one group session (three hours). As illustrated in Figure 2, the four face-to-face sessions were divided into three distinct parts. Part 1 introduced SDT and the circumplex model as theoretical frameworks, delivered in a hybrid theoretical-practical workshop format. Various techniques were used to achieve the session's objectives, including group dynamics, real-life experiences, videos, and illustrative examples. Part 2 focused on designing motivational strategies through practical workshops. In small groups, PE teachers developed specific motivational strategies for different PE contexts. Part 3 consisted of two sessions (Sessions 3 and 4), where two PE teachers were tasked with creating a PE lesson incorporating different motivational strategies learned during the programme. These sessions were conducted in a simulated real-life context, with other PE teachers and trainers acting as students.

Moreover, during the implementation phase, one individual and one group follow-up session were conducted (see Figure 2). In the individual follow-up session, trainers observed a real teaching lesson conducted by each PE teacher and subsequently provided a comprehensive report on their teaching performance. This report included: 1) the motivational strategies employed by the teacher; 2) additional motivational strategies that could have been utilised; 3) a detailed profile of their teaching based on their own scores and those of their students from the initial data collection, along with tailored recommendations to enhance their teaching profile based on the observed lesson. The group follow-up session aimed to analyze and discuss various clips of each teacher employing (de)motivating strategies in their actual lessons. These clips were taken from the first observational measure of the study.

Control group teachers did not initially receive the training programme and, as a result, did not intentionally implement any motivational strategies. They only completed the questionnaires at the same times as experimental group teachers (see Figure 2).

Data Analyses

Firstly, descriptive statistics and McDonald's omega reliability were computed for all study variables across the three measurements. While a McDonald's omega of 0.70 is commonly considered acceptable, recent research suggest interpreting reliability on a continuum. Specifically, scores between 0.90 and 0.95 are considered excellent, scores above 0.80 are good, scores above 0.70 are acceptable, scores above 0.60 are reasonable, scores above 0.50 are fair, and scores below 0.50 are deemed unacceptable (George & Mallery, 2003; Hernaez, 2015). Secondly, Levene's test and Kolmogorov–Smirnov test were performed to assess the equality of variances and normality of data distribution, respectively ($p>.05$). Thirdly, the effects of the intervention implementation on PE lessons were analysed for both teachers and students. To examine these effects, a 3 x 2 (Time x Group) repeated-measures multivariate analysis of covariance (MANCOVA) was performed for students, and a 3 x 2 (Time x Group) repeated-measures multivariate analysis (MANOVA) were performed for teachers. Gender was included as a covariate for students' analyses but not for teachers, as all experimental group teachers were male. Multiple univariate analyses with Bonferroni correction were calculated to determine between-group (i.e., experimental vs. control) and within-group (i.e., pre, intermediate, post) differences. Cohen's criteria were used to interpret small (.01), moderate (.06), and large (.14) effect sizes (Field, 2017). All statistical analyses were conducted using IBM SPSS Statistics v.25.0. Finally, to assess the fidelity of the training programme, scores from the observational measure (SIS-PE coder in Spanish) were analysed.

Results

Preliminary Analyses

Descriptive statistics (M and SD) are reported in Table 1 (students) and Table 2 (PE teachers).

Differences in (De)motivating Teaching Approaches, Need-Based Experiences, and Outcomes Related to PE from the Students' Perspective (Hypothesis 1)

Table 1 also present the results of the MANCOVA for the students. The multivariate test indicates a significant Time x Group interaction effect on the students' perception of (de)motivating approaches employed by their PE teachers (Wilks'

Lambda = .818, $F = 11.07$, $p = <.001$, $\eta_p^2 = .18$). Specifically, students in the experimental group, perceived significant increases in participative ($F = 25.76$, $p = <.001$, $\eta_p^2 = .13$), attuning ($F = 14.92$, $p = <.001$, $\eta_p^2 = .08$), and guiding ($F = 7.10$, $p = .001$, $\eta_p^2 = .04$) approaches. Conversely, they perceived significant decreases in demanding ($F = 35.90$, $p = <.001$, $\eta_p^2 = .18$) and domineering ($F = 28.99$, $p = <.001$, $\eta_p^2 = .15$) approaches. In contrast, students in the control group perceived significant increases in domineering ($F = 3.78$, $p = .024$, $\eta_p^2 = .02$) and abandoning ($F = 6.70$, $p = .001$, $\eta_p^2 = .03$) approaches.

The multivariate test indicates a significant Time x Group interaction effect on students' need-based experiences (Wilks' Lambda = .835, $F = 19.79$, $p = <.001$, $\eta_p^2 = .17$). Specifically, students in the experimental group perceived significant increases in autonomy satisfaction ($F = 45.49$, $p = <.001$, $\eta_p^2 = .22$) and competence satisfaction ($F = 12.13$, $p = <.001$, $\eta_p^2 = .07$), while experiencing significant reductions in autonomy frustration ($F = 34.36$, $p = <.001$, $\eta_p^2 = .17$) and competence frustration ($F = 21.24$, $p = <.001$, $\eta_p^2 = .11$). In contrast, students in the control group experienced a significant increase in autonomy frustration ($F = 3.52$, $p = .030$, $\eta_p^2 = .02$).

The multivariate test indicates a significant Time x Group interaction effect on students' outcomes related to PE (Wilks' Lambda = .784, $F = 36.97$, $p = <.001$, $\eta_p^2 = .22$). Specifically, students in the experimental group demonstrated significant increases in PA intention ($F = 31.92$, $p = <.001$, $\eta_p^2 = .16$), PE experiences ($F = 24.70$, $p = <.001$, $\eta_p^2 = .13$), and PE perceived learning ($F = 22.99$, $p = <.001$, $\eta_p^2 = .12$). Conversely, students in the control group experienced significant decreases in PA intention ($F = 5.38$, $p = .005$, $\eta_p^2 = .02$), PE experiences ($F = 14.50$, $p = .001$, $\eta_p^2 = .06$), and PE perceived learning ($F = 6.70$, $p = .001$, $\eta_p^2 = .03$).

The specific differences between each of the three time points (i.e., pre-test, intermediate test, and post-test) are reported in Table 1.

Differences in (De)motivating Teaching Approaches, Need-Based Experiences, and Job-Related Outcomes from the PE Teachers' Perspective (Hypothesis 2)

Table 2 shows the results of the MANOVA for the PE teachers. The multivariate test indicates a significant Time x Group interaction effect on PE teachers' perception of the (de)motivating teaching approaches (Wilks' Lambda = .367, $F = 1.87$, $p = .049$, $\eta_p^2 = .39$). Specifically, in the experimental group, there were significant in demanding approach ($F = 6.90$, $p = .028$, $\eta_p^2 = .70$). Additionally, although the univariate test was not significant by a small margin ($p = .058$), teachers did perceive a significant increase

($p = .035$) in the participative approach between T1 and T3. A similar pattern was observed with the domineering approach, where teachers reported a significant decrease between T1 and T2 ($p = .021$) and T3 ($p = .022$), even though the univariate test narrowly missed significance ($p = .079$). Likewise, for the awaiting approach, teachers perceived a significant decrease between T1 and T3 ($p = .021$), despite the univariate test not reaching significance ($p = .632$). Conversely, in the control group, there were no significant difference in any (de)motivating teaching approaches.

Regarding teachers' need-based experiences in their work, the multivariate test does not indicate a significant Time x Group interaction effect on teachers' need-based experiences (Wilks' Lambda = .312, $F = 2.21$, $p = .142$, $\eta_p^2 = .69$). Nevertheless, the univariate test showed that teachers in the experimental group reported significant increases in autonomy satisfaction ($F = 5.79$, $p = .040$, $\eta_p^2 = .66$) and competence satisfaction ($F = 15.84$, $p = .004$, $\eta_p^2 = .84$), while significantly reducing autonomy frustration ($F = 8.24$, $p = .019$, $\eta_p^2 = .73$). In contrast, teachers in the control group did not experience significant differences in the need-based experiences.

Finally, the teachers' work-related outcomes showed that the multivariate test indicates a significant Time x Group interaction effect on teachers' work-related outcomes (Wilks' Lambda = .298, $F = 3.92$, $p = .028$, $\eta_p^2 = .70$). Teachers in the experimental group showed significant increases in job performance ($F = 9.00$, $p = .016$, $\eta_p^2 = .75$). However, teachers in the control group not experienced significant differences in any work-related outcomes.

The remaining differences between each of the three time points (i.e., pre-test, intermediate test, and post-test) are reported in Table 2.

Verification of (De)motivating Teaching Strategies in PE Teachers from the Experimental Group After the Intervention (Hypothesis 3)

The results obtained from the observational through the SIS-PE Coder (Van Doren et al., 2023) at T2 and T3 for the (de)motivating teaching approaches of the experimental group of PE teachers are presented in Table 3. As seen in Table 3, the motivating teaching styles used by PE teachers are above average (i.e., $> 3.5 / 7$), with all of them nearing and the clarifying approach exceeding a score of 5 out of 7. In contrast, the (de)motivating teaching styles used by PE teachers are below average (i.e., $< 3.5 / 7$), with all of them falling below 2 out of 7.

Table 1.

Descriptive statistics and multivariate analysis of covariance for (de)motivating teaching approaches from students' perceptions.

Test time		Pre-test	Intermediate	Post-test	Pairwise comparison					Univariate test			
		(I)	(J)	(K)									
Study variables	Group	M(SD)	M(SD)	M(SD)	Time*Group	p	Mean Diff. (I-J)	Standard error	95% CID LL UL	LW	F	p	η_p^2
Participative (1-7)	Experimental	4.75(1.24) ^a	4.97(1.26) ^b	5.36(1.10) ^c	I-J	.005	-.21*	.07	-0.37 -0.05	.87	25.76	<.001	.13
					I-K	<.001	-.60*	.07	-0.78 -0.43				
					J-K	<.001	-.39*	.06	-0.53 -0.25				
	Control	4.43(1.44) ^a	4.53(1.42) ^a	4.65(1.31) ^b	I-J	.238	-.10	.06	-0.23 0.04	.99	2.65	.072	.01
					I-K	.001	-.22*	.06	-0.37 -0.08				
					J-K	.036	-.12*	.05	-0.24 -0.01				
Attuning (1-7)	Experimental	5.14(1.17) ^a	5.25(1.10) ^a	5.42(0.98) ^b	I-J	.062	-.11	.05	-0.23 -0.01	.92	14.92	<.001	.08
					I-K	<.001	-.29*	.05	-0.42 -0.16				
					J-K	<.001	-.17*	.04	-0.28 -0.07				
	Control	4.92(1.14) ^a	4.91(1.17) ^a	4.97(1.09) ^a	I-J	1.00	.01	.04	-0.10 0.10	.99	0.27	.762	.01
					I-K	.489	-.06	.05	-0.17 0.05				
					J-K	.272	-.06	.04	-0.15 0.03				
Guiding (1-7)	Experimental	5.79(0.96) ^a	5.76(1.02) ^{ab}	5.87(0.90) ^b	I-J	1.00	-.02	.05	-0.09 0.14	.96	7.10	.001	.04
					I-K	.226	-.09	.05	-0.20 0.03				
					J-K	.024	-.11*	.04	-0.21 0.01				
	Control	5.36(1.09) ^a	5.31(1.11) ^a	5.35(1.07) ^a	I-J	.881	.04	.04	-0.05 0.14	.99	1.13	.324	.01

Clarifying (1-7)	Experimental	5.51(0.94) ^a	5.50(0.88) ^a	5.63(0.81) ^b	I-K	1.00	.01	.04	-0.09	0.10				
					J-K	.896	-.04	.04	-0.12	0.05				
					I-J	1.00	.01	.05	-0.11	0.12				
	Control	5.36(0.96) ^a	5.32(1.02) ^a	5.32(1.02) ^a	I-K	.032	-.13*	.05	-0.25	-0.01				
					J-K	.004	-.13*	.04	-0.23	-0.03				
					I-J	1.00	.04	.04	-0.06	0.14				
Demanding (1-7)	Experimental	4.80(0.93) ^a	4.43(0.87) ^b	4.24(0.83) ^c	I-K	1.00	.04	.04	-0.06	0.14				
					J-K	1.00	.01	.03	-0.08	0.08				
					I-J	<.001	.37*	.05	0.25	0.48				
	Control	4.80(0.83) ^a	4.74(0.91) ^a	4.76(0.90) ^a	I-K	<.001	.56*	.05	0.45	0.68				
					J-K	<.001	.20*	.04	0.10	0.29				
					I-J	.512	.06	.04	-0.04	0.15				
Domineering (1-7)	Experimental	3.60(1.19) ^a	3.30(1.08) ^b	2.96(1.03) ^c	I-K	.910	.04	.04	-0.06	0.14				
					J-K	1.00	-.01	.03	-0.09	0.07				
					I-J	<.001	.31*	.06	0.16	0.45				
	Control	3.77(1.12) ^a	3.83(1.21) ^a	3.96(1.23) ^b	I-K	<.001	.65*	.07	0.49	0.81				
					J-K	<.001	.34*	.05	0.21	0.47				
					I-J	.673	-.06	.05	-0.18	0.06				
Abandoning (1-7)	Experimental	2.08(0.96) ^a	2.11(0.99) ^a	2.07(0.94) ^a	I-K	.003	-.18*	.06	-0.32	-0.05				
					J-K	.018	-.12*	.05	-0.23	-0.02				
					I-J	1.00	-.03	.06	-0.17	0.10				
	Control	2.53(1.19) ^a	2.56(1.27) ^a	2.70(1.32) ^b	I-K	1.00	-.01	.06	-0.15	0.16				
					J-K	1.00	.04	.05	-0.09	0.17				
					I-J	1.00	-.03	.05	-0.14	0.09				

Awaiting (1-7)	Experimental	2.04(1.00) ^a	1.99(1.03) ^a	1.98(0.99) ^a	I-K	.005	-.17*	.05	-0.30	-0.04				
					J-K	.004	-.14*	.05	-0.25	-0.04				
					I-J	1.00	.04	.06	-0.11	0.19				
					I-K	1.00	.05	.07	-0.10	0.21				
					J-K	1.00	-.05	.06	-0.12	0.14				
	Control	2.39(1.22) ^a	2.37(1.34) ^{ab}	2.49(1.29) ^a	I-J	1.00	.02	.05	-0.11	0.15				
					I-K	.180	-.10	.05	-0.23	0.03				
					J-K	.032	-.12*	.05	-0.23	-0.01				
					I-J	<.001	-.47*	.05	-0.58	-0.36				
					I-K	<.001	-.64*	.05	-0.76	-0.52				
Autonomy satisfaction (1-5)	Experimental	3.02(0.77) ^a	3.49(0.81) ^b	3.66(0.87) ^c	J-K	.001	-.17*	.05	-0.28	-0.06				
					I-J	.171	.07	.04	-0.02	0.17				
					I-K	.565	-.06	.04	-0.16	0.05				
					J-K	.003	-.13*	.04	-0.22	-0.04				
					I-J	<.001	-.28*	.05	-0.39	-0.16				
	Control	3.27(0.80) ^a	3.20(0.89) ^{ab}	3.33(0.94) ^{ac}	I-K	<.001	-.35*	.05	-0.47	-0.23				
					J-K	.322	-.07	.05	-0.18	0.04				
					I-J	<.001	.19*	.04	0.09	0.28				
					I-K	<.001	.20*	.04	0.10	0.30				
					J-K	1.00	.01	.04	-0.08	0.10				
Competence Satisfaction (1-5)	Experimental	3.70(0.86) ^a	3.97(0.84) ^b	4.05(0.84) ^b	I-J	<.001	.36*	.05	0.25	0.48				
					I-K	<.001	.49*	.05	0.37	0.62				
					J-K	.014	.13*	.05	0.02	0.24				
					I-J	<.001	-.17*	.04	-0.27	-0.08				
	Control	4.01(0.78) ^a	3.83(0.90) ^b	3.82(0.91) ^b	I-K	<.001	.20*	.04	0.10	0.30				
					J-K	1.00	.01	.04	-0.08	0.10				
					I-J	<.001	.36*	.05	0.25	0.48				
					I-K	<.001	.49*	.05	0.37	0.62				
					J-K	.014	.13*	.05	0.02	0.24				
Autonomy Frustration (1-5)	Experimental	2.72(0.85) ^a	2.36(0.85) ^b	2.23(0.89) ^c	I-J	<.001	-.17*	.04	-0.27	-0.08				
					I-K	<.001	.20*	.04	0.10	0.30				
					J-K	1.00	.01	.04	-0.08	0.10				
					I-J	<.001	.36*	.05	0.25	0.48				
					I-K	<.001	.49*	.05	0.37	0.62				
	Control	2.54(0.93) ^a	2.71(0.97) ^b	2.71(1.01) ^b	J-K	.014	.13*	.05	0.02	0.24				
					I-J	<.001	-.17*	.04	-0.27	-0.08				
					I-K	<.001	.20*	.04	0.10	0.30				
					J-K	1.00	.01	.04	-0.08	0.10				
					I-J	<.001	.36*	.05	0.25	0.48				

Competence Frustration (1-5)	Experimental	2.34(0.84) ^a	2.17(0.88) ^b	2.02(0.88) ^c	I-K	<.001	-.17*	.04	-0.28	-0.06	.89	21.34	<.001	.11
					J-K	1.00	.01	.04	-0.08	0.10				
					I-J	.002	.17*	.05	0.05	0.29				
	Control	2.22(0.98) ^a	2.29(0.99) ^{ab}	2.38(1.05) ^{bc}	I-K	<.001	.32*	.06	0.19	0.46				
					J-K	.007	.15*	.05	0.03	0.27				
					I-J	.187	-.08	.04	-0.18	0.02				
PA intention (1-7)	Experimental	4.95(1.78) ^a	5.61(1.54) ^b	5.84(1.40) ^c	I-K	.001	.17*	.05	-0.28	-0.05	.84	31.92	<.001	.16
					J-K	.094	-.09	.04	-0.19	0.01				
					I-J	<.001	-.67*	.09	-0.87	-0.46				
	Control	5.60(1.56) ^a	5.50(1.56) ^a	5.20(1.62) ^b	I-K	<.001	-.89*	.09	-1.12	-0.66				
					J-K	.021	-.22*	.08	-0.41	-0.03				
					I-J	.628	.09	.07	-0.08	0.26				
Experiences (1-5)	Experimental	3.68(0.94) ^a	4.11(0.85) ^b	4.12(0.85) ^b	I-K	<.001	.39*	.08	0.20	0.59	.87	24.70	<.001	.13
					J-K	<.001	.30*	.07	0.14	0.47				
					I-J	<.001	-.43*	.05	-0.55	-0.30				
	Control	4.17(0.75) ^a	3.82(0.99) ^b	3.81(1.01) ^b	I-K	<.001	-.43*	.06	-0.57	-0.30				
					J-K	1.00	-.01	.05	-0.14	0.12				
					I-J	<.001	.35*	.05	0.25	0.46				
Learning (1-5)	Experimental	3.44(0.97) ^a	3.87(0.88) ^b	3.95(0.90) ^b	I-K	<.001	.36*	.05	0.25	0.48	.88	22.99	<.001	.12
					J-K	1.00	.01	.05	-0.10	0.12				
					I-J	<.001	-.43*	.05	-0.55	-0.31				
	Control	3.75(0.88) ^a	3.49(0.97) ^b	3.54(1.08) ^b	I-K	<.001	-.51*	.06	-0.65	-0.37				
					J-K	.349	-.08	.05	-0.20	0.04				
					I-J	<.001	.26*	.04	0.16	0.36				

I-K	<.001	.20*	.05	0.09	0.32
J-K	.623	-.05	.04	-0.16	0.05

Note. Diff. = Difference; CID = Confidence interval differences; LW = Lambda de Wilks; LL = Lower limit; UL = Upper limit. Different letters in the superscript indicate significantly differences between the three times (i.e., pre, intermediate, post). Gender was used as covariable.

Table 2.

Descriptive statistics and multivariate analysis of covariance for (de)motivating teaching approaches from teachers' perceptions.

Test time		Pre-test	Intermediate	Post-test	Pairwise comparison					Univariate test			
		(I)	(J)	(K)									
Study variables	Group	M(SD)	M(SD)	M(SD)	Time*Group	p	Mean Diff. (I-J)	Standard error	95% CID LL UL	LW	F	p	η_p^2
Participative (1-7)	Experimental	4.34(0.77) ^a	4.75(0.77) ^a	5.31(0.58) ^b	I-J	.646	-.41	.31	-1.25 0.44	.38	4.76	.058	.61
					I-K	.035	-.97*	.34	-1.87 -0.06				
					J-K	.116	-.56	.25	-1.23 0.11				
	Control	3.50(1.19) ^a	3.94(0.87) ^a	3.66(1.11) ^a	I-J	.462	-.44	.30	-1.24 0.35	.79	0.94	.437	.21
					I-K	1.00	-.17	.32	-1.02 0.69				
					J-K	.762	.28	.23	-0.35 0.91				
Attuning (1-7)	Experimental	5.68(0.67) ^a	5.82(0.42) ^a	5.86(0.27) ^a	I-J	1.00	-.14	.19	-0.64 0.36	.80	0.73	.520	.20
					I-K	.957	-.19	.18	-0.67 0.30				
					J-K	1.00	-.05	.11	-0.34 0.24				
	Control	5.23(0.77) ^a	5.22(0.61) ^a	5.04(0.49) ^a	I-J	1.00	.01	.18	-0.47 0.47	.76	1.08	.390	.24

Guiding (1-7)	Experimental	6.05(0.61) ^a	6.29(0.43) ^a	6.41(0.90) ^a	I-K	.914	.18	.17	-0.28	0.64	.63	1.76	.250	.37
					J-K	.287	.18	.10	-0.09	0.45				
					I-J	1.00	-.16	.17	-0.62	0.30				
	Control	5.72(0.58) ^a	5.91(0.56) ^a	5.64(0.60) ^a	I-K	.069	-.38	.15	-0.78	0.02				
					J-K	.568	-.22	.16	-0.64	0.21				
					I-J	.775	-.19	.16	-0.63	0.25				
Clarifying (1-7)	Experimental	5.50(1.00) ^a	5.88(0.83) ^a	5.88(0.55) ^a	I-K	1.00	.08	.14	-0.30	0.46	.80	0.78	.502	.21
					J-K	.266	.27	.15	-0.13	0.67				
					I-J	.555	-.38	.27	-1.10	0.35				
	Control	5.51(0.40) ^a	5.56(0.80) ^a	5.60(0.80) ^a	I-K	.590	-.38	.28	-1.12	0.37				
					J-K	1.00	.00	.19	-0.52	0.52				
					I-J	1.00	-.04	.25	-0.73	0.64				
Demanding (1-7)	Experimental	4.12(0.58) ^a	3.73(0.63) ^a	3.17(0.76) ^b	I-K	1.00	-.09	.26	-0.79	0.62	.30	6.90	.028	.70
					J-K	1.00	-.04	.18	-0.53	0.45				
					I-J	.273	.39	.22	-0.19	0.97				
	Control	4.37(0.48) ^a	4.08(0.51) ^a	4.23(0.40) ^a	I-K	.001	.96*	.20	0.43	1.50				
					J-K	.009	.57*	.16	0.13	1.00				
					I-J	.534	.29	.20	-0.26	0.84				
Domineering (1-7)	Experimental	3.07(0.69) ^a	2.42(.86) ^b	2.23(0.76) ^b	I-K	1.00	.13	.19	-0.38	0.64	.43	3.99	.079	.57
					J-K	.927	-.16	.15	-0.57	0.25				
					I-J	.021	.65*	.21	0.09	1.21				
	Control	3.86(0.79) ^a	3.73(0.60) ^a	3.88(0.63) ^a	I-K	.022	.85*	.27	0.11	1.59				
					J-K	1.00	.20	.24	-0.45	0.85				
					I-J	1.00	.13	.20	-0.39	0.66				

Abandoning (1-7)	Experimental	1.78(0.45) ^a	1.55(0.40) ^a	1.71(0.37) ^a	I-K	1.00	-.02	.26	-0.72	0.67	.60	2.03	.213	.40
					J-K	1.00	-.16	.23	-0.77	0.46				
					I-J	.064	.24	.09	-0.01	0.48				
	Control	2.09(0.70) ^a	2.13(0.75) ^a	2.02(0.45) ^a	I-K	1.00	.08	.14	-0.30	0.46				
					J-K	.989	-.16	.15	-0.57	0.26				
					I-J	1.00	-.03	.09	-0.26	0.20				
Awaiting (1-7)	Experimental	2.75(1.08) ^a	2.19(0.84) ^a	2.25(0.65) ^a	I-K	1.00	.08	.13	-0.28	0.44	.99	0.46	.632	.01
					J-K	1.00	.11	.13	-0.28	0.50				
					I-J	.070	.56	.22	-0.04	1.16				
	Control	2.47(0.96) ^a	2.42(0.96) ^{ab}	2.19(1.04) ^a	I-K	.021	.50*	.16	0.07	0.93				
					J-K	1.00	-.06	.19	-0.58	0.45				
					I-J	1.00	.06	.21	-0.51	0.62				
Autonomy satisfaction (1-5)	Experimental	3.94(0.72) ^a	4.69(0.61) ^b	4.63(0.50) ^b	I-K	.254	.28	.15	-0.13	0.68	.48	3.21	.113	.52
					J-K	.712	.22	.18	-0.26	0.71				
					I-J	.020	-.75*	.24	-1.39	-0.11				
	Control	3.58(0.38) ^a	3.36(0.55) ^a	3.31(0.67) ^a	I-K	.049	-.69*	.26	-1.37	-0.01				
					J-K	1.00	.06	.19	-0.45	0.57				
					I-J	1.00	.07	.23	-0.38	0.83				
Competence satisfaction (1-5)	Experimental	3.75(0.50) ^a	4.62(0.53) ^b	4.60(0.48) ^b	I-K	.795	.27	.24	-0.37	0.92	.16	15.34	.004	.84
					J-K	1.00	.06	.18	-0.43	0.54				
					I-J	<.001	-.88*	.17	-1.33	-0.42				
	Control	3.27(0.44) ^a	3.47(0.65) ^a	3.53(0.57) ^a	I-K	.002	-.84*	.19	-1.37	-0.32				
					J-K	1.00	.03	.18	-0.46	0.53				
					I-J	.732	-.19	.16	-0.63	0.24				

Autonomy frustration (1-5)	Experimental	2.31(0.72) ^a	1.91(0.65) ^a	1.31(0.35) ^b	I-K	.572	-.25	.18	-0.74	0.24	.27	8.24	.019	.73
					J-K	1.00	-.06	.17	-0.52	0.41				
					I-J	.295	.41	.23	-0.22	1.03				
					I-K	.047	.99*	.37	0.01	1.99				
	Control	2.42(0.65) ^a	2.31(0.70) ^a	2.66(0.83) ^a	J-K	.077	.59	.24	-0.05	1.24	.58	2.58	.145	.42
					I-J	1.00	.11	.22	-0.48	0.70				
					I-K	1.00	-.25	.35	-1.18	0.68				
					J-K	.392	-.36	.23	-0.97	0.25				
Competence frustration (1-5)	Experimental	2.16(0.53) ^a	1.87(0.58) ^a	1.53(0.72) ^a	I-J	.862	.28	.25	-0.41	0.97	.40	4.46	.065	.60
					I-K	.341	.63	.37	-0.38	1.63				
					J-K	.628	.34	.26	-0.36	1.05				
					I-J	.311	-.42	.24	-1.06	0.23				
	Control	1.89(0.56) ^a	2.31(0.54) ^a	2.64(0.93) ^a	I-K	.148	-.75	.35	-1.70	0.20	.74	1.25	.344	.26
					J-K	.592	-.33	.25	-1.00	0.33				
					I-J	1.00	-.13	.15	-0.54	0.29				
					I-K	.035	-.88*	.30	-1.69	-0.06				
Job performance (1-9)	Experimental	7.25(0.88) ^a	7.38(0.92) ^a	8.13(0.64) ^b	J-K	.029	-.75*	.25	-1.43	-0.07	.25	9.00	.016	.75
					I-J	1.00	<.001	.15	-0.39	0.39				
					I-K	.215	.57	.29	-0.22	1.33				
					J-K	.104	.57	.24	-0.09	1.20				
	Control	6.78(0.83) ^a	6.78(0.83) ^a	6.22(0.83) ^a	I-J	1.00	<.001	.21	-0.58	0.58	.49	3.08	.120	.51
					I-K	.080	-.47	.19	-0.98	0.05				
					J-K	.306	-.47	.27	-1.19	0.26				
					I-J	1.00	.17	.20	-0.38	0.71				
Job Satisfaction (1-6)	Experimental	5.07(0.59) ^a	5.06(0.87) ^a	5.53(0.45) ^a	I-J	1.00	<.001	.21	-0.58	0.58	.49	3.08	.120	.51
					I-K	.080	-.47	.19	-0.98	0.05				
					J-K	.306	-.47	.27	-1.19	0.26				
					I-J	1.00	.17	.20	-0.38	0.71				
	Control	4.42(0.70) ^a	4.25(0.93) ^a	4.14(0.70) ^a	I-J	1.00	.17	.20	-0.38	0.71	.68	1.62	.264	.32
					I-K	.080	-.47	.19	-0.98	0.05				
					J-K	.306	-.47	.27	-1.19	0.26				
					I-J	1.00	.17	.20	-0.38	0.71				

Emotional Exhaustion (0-6)	Experimental	1.70(0.48) ^a	1.60(0.73) ^a	1.28(0.58) ^a	I-K	.429	.28	.18	-0.21	0.76	.57	2.30	.181	.43
					J-K	1.00	.11	.25	-0.57	0.80				
					I-J	1.00	.10	.16	-0.32	0.52				
					I-K	.307	.43	.24	-0.23	1.08				
	Control	2.51(1.43) ^a	2.40(1.29) ^a	2.84(1.11) ^a	J-K	.506	.33	.23	-0.28	0.93	.65	1.91	.218	.35
					I-J	1.00	.11	.15	-0.28	0.51				
					I-K	.505	-.33	.23	-0.95	0.29				
					J-K	.160	-.44	.21	-1.02	0.13				

Note. Diff. = Difference; CID = Confidence interval differences; LW = Lambda de Wilks; LL = Lower limit; UL = Upper limit. Different letters in the superscript indicate significantly differences between the three times (i.e., pre, intermediate, post).

Table 3.

Observational results of the (de)motivating teaching approaches in experimental PE teachers.

Teaching approaches	Session 1 (T2)		Session 2 (T3)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Participative	4.08	1.00	4.78	1.03
Attuning	4.26	0.75	4.79	0.55
Guiding	4.99	0.91	4.79	0.88
Clarifying	5.30	0.74	5.54	0.55
Demanding	2.26	0.50	1.85	0.43
Domineering	1.34	0.13	1.40	0.24
Abandoning	1.42	0.28	1.34	0.29
Awaiting	1.32	0.21	1.51	0.31

Discussion

The present research aimed to examine the effects of the MotivaDosEF (García-Cazorla, Sevil-Serrano, et al., 2024) from the perspectives of both students and teachers, the motivational process for both students and teachers, and various PE-related outcomes for both groups. The main findings of the study revealed that: a) students in the experimental group exhibited increased levels of perceived autonomy-supportive and structuring approaches used by their PE teachers, BPN satisfaction, PA intention, quality of their experiences, and perceived learning, while reducing levels of perceived controlling approaches used by their PE teachers and BPN frustration; b) students in the control group showed increased levels of perceived domineering and abandoning approaches used by their PE teachers and autonomy frustration, along with decreased levels of PA intention, quality of their experiences, and perceived learning; c) PE teachers in the experimental group reported increased levels of BPN satisfaction and job performance, along with increased levels of participative approach and decreased levels of demanding, domineering, and awaiting approaches and autonomy frustration; d) PE teachers in the control group did not exhibit significant changes in any variable; e) The observational measure indicated fidelity in the MotivaDosEF programme, as it confirmed a higher frequency of motivating teaching approaches compared to demotivating ones after the intervention.

Differences in (De)motivating Teaching Approaches, Need-Based Experiences, and Outcomes Related to PE from the Students' Perspective (Hypothesis 1)

Firstly, following our hypothesis and consistent with previous SDT-based training programmes (Cheon et al., 2020; Reeve & Cheon, 2024), students in the experimental group reported an increased perception of the participative and guiding approaches (i.e., autonomy support), as well as guiding and clarifying approaches (i.e., structure), while observing a reduction in demanding and domineering approaches (i.e., control) used by their PE teachers. These changes may have been driven by the specific strategies implemented during the training programme (García-Cazorla, Sevil-Serrano et al., 2024). For example, in line with previous SDT-based interventions (Cheon et al., 2020; Tilga et al., 2021), one key factor in shifting student perceptions is providing a strong theoretical foundation for teachers on the impact of (de)motivating teaching styles. Changing teachers' beliefs about the importance of their teaching style, and its positive or negative consequences, is crucial for driving behavioural change (Reeve & Cheon, 2021). Likewise, the use of a congruent style during the training also has an

impact in the process, as teachers can observe that the strategies learned really work (Aelterman et al., 2013). Moreover, the personalised follow-up sessions included in the programme allowed teachers to focus on improving their teaching profile based on their individual needs. During the first follow-up session, trainers observed a live lesson of each PE teacher and provided instant feedback along with a personalised report, including specific strategies for improvement. This individualised approach has been shown to enhance teachers' sense of competence and improve their teaching performance (González-Peño et al., 2023). In the second follow-up session, video recordings of each teacher's class were reviewed and analysed collaboratively with them, facilitating targeted, practical strategies for improvement. This use of personal video analysis has been found to be highly beneficial for teachers (Tripp et al., 2012). For instance, when teachers see that their students respond more positively to autonomy-supportive and structuring approaches than to controlling strategies, they are more likely to continue using the former in their teaching, leading to observable changes in student perceptions. Moreover, providing supplementary materials, such as the motivational strategies dossier given to teachers, likely contributed to sustaining improvements in their teaching style over time by serving as a practical reference (Reeve & Cheon, 2021). Likewise, as demonstrated in the training programme by Reeve & Cheon (2024), the use additional strategies as demonstrational examples (Assor et al., 2018), how-to video modeling (Escriva-Boulley et al., 2018), training and practice sessions (Zhang et al., 2021), lesson planning (Abula et al., 2020), role-playing exercises (Zhang et al., 2021), teaching simulations (Levin, 2024), problem-solving activities (Ulstad et al., 2018), one-on-one guidance and mentoring (Escriva-Boulley et al., 2018), and group discussions with peer teachers (Abula et al., 2020) as well as with students (Kaplan & Assor, 2012) have proven beneficial in enhancing students' perception of their teachers' performance.

Secondly, following our hypothesis and consistent with previous SDT-based training programmes (Cheon et al., 2020; Reeve & Cheon, 2024), students in the experimental group who increased levels of their perception of their PE teachers' participative and attuning approaches (i.e., autonomy-supportive style), guiding and clarifying approaches (i.e., structuring style), and reduced levels of demanding and domineering approaches (i.e., controlling style) during the programme (T1-T3) experienced greater autonomy and competence satisfaction and reduced frustration of both, as well as higher levels of PA intention, experiences in PE, and learning in PE.

Interestingly, between T1 and T2, the most significant changes in teaching approaches were observed in the participative approach, which increased, and in both controlling approaches (demanding and domineering), which decreased. Despite these changes occurring in only two teaching styles, students reported higher levels of autonomy and competence satisfaction, improved perceived learning, enhanced experiences in PE, increased PA intention, and lower levels of autonomy and competence frustration. In this context, previous SDT-based training programmes have demonstrated significant changes in students with only an increase in autonomy-supportive style (e.g., Schneider et al., 2020; Tilga et al., 2021), or with an increase in autonomy support and a reduction in control (Reeve & Cheon, 2024). For instance, when teachers allow students to make decisions during lessons (i.e., participative approach), it is likely that their sense of autonomy is fulfilled. Additionally, when teachers adjust the sessions to align with students' needs and preferences, it enhances their sense of competence, as they are working on tasks they find personally engaging. Moreover, reducing the teacher's position of authority (i.e., demanding approach) and avoiding personal attacks after student mistakes (i.e., domineering approach) likely decreases frustration of students' BPN. Ultimately, these increases in BPN satisfaction and reductions in BPN frustration led to more positive outcomes for students (Vasconcellos et al., 2020).

However, in the present study, between T2 and T3, when teachers not only increased the use of the participative approach and decreased demanding and domineering approaches but also increased the attuning, guiding, and clarifying approaches, additional improvements were observed. These included continuous improvements in autonomy and competence satisfaction and reduced frustration, as well as in PA intention, experiences, and learning. Therefore, it seems necessary to create training programmes that do not simply include strategies from one or two (de)motivating teaching styles, but rather incorporate a comprehensive approach that the circumplex model (Aelterman et al., 2019) with its eight (de)motivating teaching approaches provides. It is essential to incorporate motivational strategies that help increase levels of those motivating approaches (i.e., participative, attuning, guiding, and clarifying), as it is the most “motivating cocktail” (Jang et al., 2010), but also it is crucial to reduce demotivating ones (i.e., demanding, domineering, abandoning, and awaiting). This comprehensive approach will lead to additional improvements in all variables of the students' motivational process, including PE-related outcomes. For example, a teacher who has received comprehensive training on the eight teaching

approaches of the circumplex model will, when presenting a task, offer students choices on how to position themselves in the space and what materials to use (i.e., participative approach), be willing to adjust a rule based on students' interests (i.e., attuning approach), provide individualised feedback according to students' capabilities (i.e., guiding approach), carefully explain the objectives of the tasks (i.e., clarifying approach), avoid using punishments if a student fails (i.e., demanding approach), avoid showing disapproval when this happens (i.e., domineering approach), persist with students who struggle to achieve the task after several attempts (i.e., abandoning approach), and not give total freedom without providing any guidelines (i.e., awaiting approach).

Thirdly, consistent with past SDT-based circumplex model research (Burgueño, Abós, et al., 2024; Diloy-Peña et al., 2024), students in the control group who increased the levels of the domineering and abandoning approaches also experienced increased levels of autonomy frustration, which in turn led to decreased PA intention, experiences, and learning. This could be explained by the fact that students who perceive their PE teachers as using power-assertive strategies (i.e., domineering approach) and/or a laissez-faire attitude (i.e., abandoning approach) are likely to have their autonomy frustrated. Domineering approaches undermine students' autonomy by employing emotional manipulation (e.g., inducing shame after a failure), which restricts their ability to make autonomous decisions, as they fear experiencing those negative emotions (Vansteenkiste et al., 2019). Additionally, the feeling of abandonment by the teacher when something goes wrong may be interpreted by students as excessive freedom or lack of concern (Soenens et al., 2007). This can lead to autonomy frustration, as it does not matter whether they perform well or poorly or what decisions they make, since the teacher is not attentive to them (Vansteenkiste et al., 2019). Furthermore, it seems likely that a teacher who employs the most demotivating behaviors from the circumplex model generates worse experiences for their students, less learning, and reduced motivation to engage in physical activity in the future (Aelterman et al., 2019).

Finally, neither group (i.e., experimental and control) exhibited significant differences in the abandoning and awaiting approaches (i.e., chaotic style). It is always difficult to interpret a null effect, but it may be a fruitful undertaking to help guide future investigations, so we introduce one consideration. This could be attributed to the low initial levels from which both groups (i.e., experimental and control) started and the

limited scope for improvement of the PE teachers. Similar to other SDT-training programmes (e.g., Schneider et al., 2020), when a variable is close to its limit (either upper or lower), it becomes difficult to detect significant effects.

Differences in (De)motivating Teaching Approaches, Need-Based Experiences, and Job-Related Outcomes from the PE Teachers' Perspective (Hypothesis 2)

For the teachers in the experimental group, the study hypothesis (H2) is partially confirmed, as significant changes and improvements were observed in some of the study variables (autonomy and competence satisfaction, autonomy frustration, participative, demanding, domineering, and awaiting approaches, and job performance). Previous SDT-training programmes (e.g., Tilga et al., 2021) showed that those PE teachers who have participated in a training programme of motivating teaching strategies increase their levels of the BPN satisfaction. In line with previous studies on the circumplex model (Vermote et al., 2023), the BPN satisfaction positively predicts autonomy-supportive (i.e., participative, attuning) and structuring styles (i.e., guiding, and clarifying), while BPN frustration positively predicts controlling (i.e., demanding and domineering) and chaotic styles (i.e., abandoning and awaiting). Thus, by increasing BPN satisfaction and reducing BPN frustration, the levels of the participative approach are increased, along the levels of the demanding, domineering, and awaiting approaches were reduced. Therefore, it seems that the use of all the strategies mentioned in the previous section were sufficient to provoke great changes in both students and teachers. For instance, the use of a congruent style (Aelterman et al., 2013) can enhance teachers' beliefs about change (Reeve & Cheon, 2021), and if it is also accompanied by a solid repertoire of strategies to apply during the programme (see previous section) and application strategies to use during their classes with students (motivational strategies dossier based on Ahmadi et al., 2023), it seems that teachers also perceive a significant improvement in their profile as PE teachers. Finally, it is worth noting that previous SDT-training programmes have demonstrated positive relationships between satisfaction of BPN (e.g., Tilga et al., 2021) and the development of more autonomy-supportive and structuring approaches in PE teachers (Cheon et al., 2020), which in turn correlate with higher job performance. This could explain the observed increases in job performance. Teachers who feel more autonomous and competent, equipped with a broader range of strategies, perceive their teaching performance to be higher.

Verification of (De)motivating Teaching Strategies in PE Teachers from the Experimental Group After the Intervention (Hypothesis 3)

Following the study hypothesis (H3), the results obtained from the observational measure support and explain the improvements obtained in the experimental group. support the values obtained from the quantitative measure. These results show that the most frequently used teaching approaches by PE teachers in the experimental group during and after the training are participative, attuning, guiding, and clarifying, while the least used approaches are demanding, domineering, abandoning, and awaiting. Additionally, it can be observed that the largest increases between T2 and T3 in the observational measure occur in the participative ($T2-T3 = -0.70$) and attuning ($T2-T3 = -0.53$) approaches, similar to what is observed in the quantitative measure. Likewise, the greatest reduction is seen in the demanding approach ($T2-T3 = 0.41$), as also reflected in the quantitative measure. Furthermore, the abandoning ($T2-T3 = 0.08$) and awaiting ($T2-T3 = -0.19$) approaches show minimal differences between both measurements, mirroring the findings from the quantitative measure. Thus, these results largely support the findings obtained from the second and third quantitative measures, showing similar results across both measurement methods.

Limitations and Future Research Avenues

Some limitations of the study are as follows. Firstly, observations were conducted twice to ensure the fidelity of the (de)motivating teaching approaches during the T2 and T3 quantitative measures. However, observations were not used in T1 to compare and demonstrate real behavioral changes. Consequently, incorporating observational measures at each quantitative measurement point could help triangulate the data and enhance the comparison of results with the quantitative measures, providing a more comprehensive assessment of progress. Secondly, although teachers' may play a crucial role in the changes or not (de)motivating teaching approaches, were not assessed through questionnaires due to their length and the absence of validated instruments for measuring controlling and chaotic styles. Additionally, teachers' perceptions of depersonalisation and reduced personal accomplishment (i.e., burnout factors) were not assessed using questionnaires due to their length, despite its possible influence on the process. Lastly, a post-intervention follow-up measure could not be conducted in the subsequent academic year due to the common practice in Spain of teachers changing schools annually. Therefore, assessing students' perceptions of the study variables was only possible if they had the same teacher. Additionally, the

perception of (de)motivating teaching styles might have varied with different classroom groups.

Conclusions

MotivaDosEF has proven to be an effective programme for improving the motivational teaching style of PE teachers, as well as enhancing the motivational process for both teachers and their students and achieving to better outcomes for both. To extend the existing scientific evidence and previous SDT-training programmes this teacher training programme have demonstrated that, in addition to training PE teachers to be more autonomy-supportive, combining this with being more structuring and reducing controlling and chaotic behaviors, it is essential to include a broader learning perspective (using all approaches of the circumplex model). This involves fostering motivating approaches and reducing or avoiding demotivating ones, as it has shown to achieve optimal results in the motivational process and various outcomes for both students and teachers, elevating the overall impact of the results and the improvements. This means that, besides creating training programmes that teach strategies for allowing students to make decisions in tasks or sessions (i.e., participative approach) and inquiring about their interests (i.e., attuning approach), strategies must be provided to construct individualised and specific feedback (i.e., guiding approach) and to create clear and specific explanations of objectives and tasks (i.e., clarifying approach). Additionally, alongside all the strategies to promote these motivating approaches, strategies must also be provided to inhibit demotivating approaches, such as avoiding the use of a demanding and pressuring tone when students struggle (i.e., demanding approach), refraining from showing through gestures that the teacher is in command and students must simply obey (i.e., domineering approach), not abandoning students who do not meet objectives by failing to give them enough time (i.e., abandoning approach), and not neglecting student education by providing vague and imprecise explanations and objectives (i.e., awaiting approach). Thus, MotivaDosEF programme has shown that very good results are obtained not only in improving the teacher profile from the perspectives of students and the teachers themselves, but also in the autonomy and competence satisfaction of both, and different outcomes for students (i.e., PA intention, experiences, and learning) and teachers (i.e., job performance and job satisfaction).

Furthermore, this study highlights the necessity for initial and continuous teacher training in SDT and the circumplex model to improve experiences in PE classes. This research underscores that comprehensive training programmes are crucial for

equipping PE teachers with the skills and strategies necessary to create a motivating and need-supportive classroom environment. Such training can significantly enhance the overall educational experience, leading to better motivational outcomes and improved performance for both students and teachers.

5. Limitaciones y Prospectivas

5. Limitaciones y Prospectivas

Si bien las limitaciones y prospectivas específicas se detallan en cada uno de los estudios incluidos en esta Tesis Doctoral, es relevante destacar algunas consideraciones que abarcan el proyecto de investigación en su conjunto.

En primer lugar, el tipo de muestreo utilizado en todos los estudios fue no probabilístico, lo que limita la generalización de los hallazgos y la validez externa de los resultados obtenidos. Futuras investigaciones podrían beneficiarse de un muestreo probabilístico estratificado, donde se asegure que se recojan datos de subgrupos específicos dentro de la población de docentes, en función de variables como la edad, género, nivel educativo, o experiencia profesional. Esto permitiría obtener muestras más representativas, aumentando la capacidad de extrapolar los resultados. Sin embargo, cabe destacar que, aunque la muestra no sea probabilística, el tamaño muestral es robusto, lo que otorga a los hallazgos una alta validez interna. Esto permite que, aunque no sean generalizables, los resultados sean confiables y útiles como punto de partida para futuras investigaciones.

En segundo lugar, los dos primeros estudios presentan un diseño transversal, lo cual impide establecer relaciones causales entre las variables investigadas. Si bien se pueden identificar correlaciones, no se puede determinar si una variable causa directamente cambios en otra. En contraposición, el último estudio de la tesis utilizó un diseño cuasi-experimental de tres tiempos (i.e., longitudinal), lo que permitió observar cambios a lo largo del tiempo y aporta mayor solidez a los hallazgos generales. Además, mientras que los primeros estudios utilizaron únicamente cuestionarios autoreportados por los docentes para evaluar las variables, en el último estudio se ampliaron las fuentes de datos mediante cuestionarios aplicados a los estudiantes y la inclusión de observaciones externas. Este enfoque permite contrastar y triangular la información obtenida, mejorando así la validez de los resultados. En futuras investigaciones sería recomendable complementar estos métodos con entrevistas en profundidad o grupos de discusión, lo que, junto con las metodologías cuantitativas y observacionales, ayudaría a comprender mejor los resultados y las relaciones entre las variables.

En tercer lugar, algunos estudios, como el segundo y el cuarto, emplearon variables medidas con un único ítem para evaluar constructos importantes como el rendimiento profesional, las experiencias en EF y aprendizaje percibido. Aunque estas

medidas han sido defendidas en algunos contextos (Allen et al., 2022; Matthews et al., 2022), el uso de un único ítem plantea limitaciones en cuanto a la fiabilidad y profundidad de la información que pueden captar, por lo tanto, es necesario interpretar los resultados con cautela. Futuras investigaciones podrían beneficiarse del uso de escalas multi-ítem, que permitirían evaluar con mayor precisión estos constructos y ofrecerían un panorama más completo de las variables en cuestión. Esto también permitiría valorar la consistencia interna de las medidas, mejorando así la solidez de los resultados.

En cuarto lugar, la extensión del cuestionario SIS-PE (Burgueño, Abós, et al., 2024), compuesto por 48 ítems, limitó la inclusión de algunas variables de interés. Dado que se realizaron tres mediciones tanto en los docentes como en los estudiantes, se decidió omitir ciertas variables, como las relaciones sociales y la calidad de la motivación, para evitar una sobrecarga de preguntas, especialmente en los estudiantes. Sin embargo, estas variables podrían haber sido relevantes para el análisis. Investigaciones futuras podrían considerar su inclusión, así como otras variables de interés científico, como las emociones y las creencias del profesorado de EF. Esto permitiría obtener una visión más completa de los antecedentes y consecuencias que influyen en el estilo motivacional del profesorado de EF, y, en última consecuencia, en la calidad del sistema educativo.

Finalmente, esta tesis proporciona una base sólida para futuras investigaciones centradas en el desarrollo de programas formativos dirigidos al profesorado de EF. Las perspectivas de investigación incluyen la necesidad de diseñar intervenciones personalizadas que tengan en cuenta las necesidades específicas de los docentes en diversos contextos educativos. No obstante, cabe destacar que, en el programa de intervención de la presente tesis, solo participaron hombres en el grupo experimental, lo que limita la generalización de los resultados. Futuros estudios de intervención deberían considerar la paridad de género para comprobar si la intervención es igualmente efectiva en hombres y mujeres. Un enfoque integrador de este tipo contribuiría a mejorar tanto la calidad de la enseñanza como el sistema educativo en general.

6. Conclusiones Generales / General Conclusions

6. Conclusiones Generales

Las conclusiones generales de esta Tesis Doctoral, a pesar de que cada estudio presenta sus propias conclusiones, se estructuran a partir de los hallazgos globales obtenidos a lo largo del proyecto.

Estudio 1: Este estudio, fundamentado en el modelo circular y la TAD, subraya la importancia de factores sociodemográficos y del proceso motivacional en la adopción de estilos motivacionales por parte del profesorado de EF. En primer lugar, se concluye que ciertos factores personales, como el género, la etapa educativa y la experiencia docente, juegan un papel relevante en el estilo motivacional. Los docentes varones, aquellos con más experiencia y quienes enseñan en educación secundaria, tienden a mostrar un menor apoyo a la autonomía (i.e., participativo y adaptativo), adoptando más frecuentemente estilos controladores (i.e., demandante y dominador) y caóticos (i.e., de abandono y a la espera). En segundo lugar, se destaca el papel central que tiene el proceso motivacional del docente. Aquellos que experimentan satisfacción en sus NPB tienden a mostrar una motivación autónoma hacia la enseñanza, lo que a su vez promueve el uso de enfoques de apoyo a la autonomía y de estructura (i.e., orientador y clarificador). Por el contrario, la frustración de estas necesidades conduce a una mayor probabilidad de que los docentes adopten una motivación controlada o desmotivación, lo que fomenta estilos controladores y caóticos en la gestión del aula. En conjunto, estas conclusiones resaltan la importancia de abordar tanto las características sociodemográficas del profesorado como su proceso motivacional para promover un estilo docente que favorezca un entorno educativo más motivador y estructurado en el ámbito de la EF. Por ejemplo, dada la influencia de las variables sociodemográficas, resulta crucial prestar especial atención a los docentes varones, de educación secundaria y con mayor experiencia, en la implementación de estrategias motivacionales, ya que muestran una mayor necesidad de apoyo en este aspecto. En relación con el proceso motivacional, es fundamental que los equipos directivos de los centros educativos enfoquen sus esfuerzos en nutrir las NPB de sus docentes, lo cual favorecerá una motivación más autodeterminada y el uso de estilos docentes más motivadores.

Estudio 2: Este estudio revela que los docentes de EF no adoptan un único enfoque motivacional, sino que tienden a combinar distintos niveles de apoyo a la autonomía, estructura y control en su práctica educativa. Aquellos docentes que combinan un alto apoyo a la autonomía con una estructura adecuada logran niveles

superiores de motivación autónoma, lo que contribuye a un aumento de su satisfacción laboral y una mejora de su rendimiento profesional. En contraste, los docentes que, aunque estructurados, mantienen un enfoque controlador alto o moderado, evidencian una motivación más controlada y una mayor desmotivación, lo cual repercute negativamente tanto en su satisfacción laboral como en su rendimiento. Los hallazgos de este estudio enfatizan la relevancia de promover estilos motivacionales centrados en el apoyo a la autonomía y la estructura, ya que estos contribuyen a un proceso motivacional de mayor calidad y a un mejor desempeño profesional y psicológico. Además, se concluye que el uso de un estilo controlador, incluso cuando se combina con enfoques motivadores, resulta perjudicial tanto a corto como a largo plazo para el bienestar psicológico y laboral del profesorado. En línea con las conclusiones del primer estudio, los resultados refuerzan la necesidad de diseñar programas de formación para el profesorado basados en el modelo circular, dirigidos no solo a fomentar el apoyo a la autonomía y una estructura sólida, sino también a minimizar el control, que sigue siendo común en las prácticas docentes de EF.

Estudio 3: El tercer estudio establece un protocolo detallado del programa de formación “MotivaDosEF”, diseñado específicamente para docentes de EF en la etapa de secundaria. Este programa, fundamentado en la evidencia científica y teóricamente anclado en el modelo circular, tiene como objetivo mejorar el estilo motivacional de los docentes de EF. Se subraya la importancia de diseñar un protocolo bien estructurado antes de implementar cualquier programa. Para lograrlo, es fundamental apoyarse en la evidencia científica, comprender el contexto de aplicación y las necesidades de los participantes potenciales, así como contrastar el diseño con otros expertos en el campo de la EF. Este enfoque de trabajo facilita la eficacia del programa minimizando los errores en el proceso. Además, la divulgación del diseño a través de un estudio de protocolo garantiza la transparencia en la implementación y promueve su replicabilidad en diversos contextos educativos. En conjunto, este estudio de protocolo contribuye a una formación más eficaz y sostenible a largo plazo, asegurando que se logren los objetivos de mejora tanto en el ámbito docente como en el aprendizaje de los estudiantes.

Estudio 4: El último estudio de esta Tesis Doctoral muestra la eficacia del programa formativo “MotivaDosEF”, fundamentado en el modelo circular y en la TAD. Este programa impacta positivamente en el estilo motivacional docente, en el proceso motivacional y en diversas consecuencias relacionadas con el trabajo. Además, se

confirma que la formación recibida por el profesorado influye directamente en el proceso motivacional del alumnado y en diversas consecuencias en el ámbito de la EF y en contextos extraescolares (e.g., hábitos de práctica de AF). Este estudio subraya la importancia de capacitar al profesorado no solo en estrategias que fomenten enfoques motivadores, como los participativos, adaptativos, orientadores y clarificadores, sino también en la sensibilización sobre la necesidad de reducir la utilización de enfoques desmotivadores, tales como los demandantes, dominadores, de abandono y a la espera. Asimismo, el apoyo en la literatura científica contemporánea a través de herramientas como la observación, las tutorías individualizadas, la adaptación del programa a las necesidades específicas de los docentes, el uso de vídeos y ejemplos prácticos, junto con un estilo de formación alineado con los principios de la TAD, son estrategias clave para alcanzar los beneficios significativos observados en “MotivaDosEF”. Estos elementos son esenciales para generar un entorno motivador y de apoyo en el aula, que potencie tanto el proceso motivacional y psicológico de los docentes como el de los estudiantes. Este enfoque formativo tiene el potencial de transformar la experiencia educativa en su conjunto, llevando a mejores resultados motivacionales y un rendimiento superior tanto para los estudiantes como para los docentes.

6. General conclusions

Although each study presents its own conclusions, the general conclusions of this Doctoral Thesis are structured around the overall findings obtained throughout the project.

Study 1: This study, grounded in the circumplex model and SDT, emphasises the significance of sociodemographic factors and the motivational process in shaping PE teachers' (de)motivating teaching styles. Firstly, it concludes that certain personal factors, such as gender, school level, and teaching experience, play a crucial role in determining (de)motivating teaching styles. Male teachers, those with more experience, and those teaching at the secondary level tend to provide less autonomy support (i.e., participative and attuning) and more frequently adopt controlling (i.e., demanding and domineering) and chaotic (i.e., abandoning and awaiting) styles. Secondly, the central role of the teacher's motivational process is highlighted. Teachers who experience satisfaction in their BPN tend to exhibit autonomous motivation towards teaching, which in turn promotes autonomy-supportive (i.e., participative and attuning) and structuring (i.e., guiding and clarifying) approaches. Conversely, frustration of these needs increases the likelihood of teachers adopting controlled motivation or amotivation, leading to the use of controlling (i.e., demanding and domineering) and chaotic (i.e., abandoning and awaiting) styles in classroom management. Collectively, these conclusions highlight the importance of addressing both the sociodemographic characteristics of teachers and their motivational processes to foster a more motivating and structured educational environment in PE. For instance, given the influence of sociodemographic variables, it is essential to focus particular attention on male teachers, those teaching at secondary school and those with more experience when implementing motivational strategies, as they tend to have a greater need for support in this area. Regarding the motivational process, it is crucial for school management teams to direct their efforts towards nurturing the BPN of their teachers, which will encourage more self-determined motivation and the use of more motivating teaching styles.

Study 2: This study reveals that PE teachers do not adopt a single (de)motivating teaching approach but tend to combine varying levels of autonomy support, structure, and control in their teaching practices. Teachers who combine high autonomy support with appropriate structure achieve higher levels of autonomous motivation, which contributes to greater job satisfaction and improved professional

performance. In contrast, teachers who are structured but maintain a high or moderate controlling approaches exhibit more controlled motivation and greater amotivation, which negatively impacts both job satisfaction and performance. The findings of this study underscore the importance of promoting motivating styles focused on autonomy support and structure, as these lead to a higher-quality motivational process and better professional and psychological outcomes. Furthermore, it is concluded that the use of a controlling style, even when combined with motivating approaches, is detrimental both in the short and long term for the psychological and professional well-being of teachers. In line with the conclusions of the first study, these results reinforce the need to design training programmes for teachers based on the circumplex model, aimed at fostering autonomy support and strong structure while minimising the use of control, which remains prevalent in PE teaching practices.

Study 3: The third study establishes a detailed protocol for the “MotivaDosEF” training programme, specifically designed for secondary PE teachers. This programme, grounded in scientific evidence and theoretically anchored in the circumplex model, aims to improve PE teachers’ (de)motivating teaching styles and approaches. The importance of designing a well-structured protocol before implementing any programme is emphasised. To achieve this, it is essential to rely on scientific evidence, understand the context of application and the needs of potential participants, and cross-check the design with other experts in the field of PE. This approach ensures the effectiveness of the programme by minimising errors during implementation. Additionally, the dissemination of the design through a protocol study guarantees transparency in implementation and promotes its replicability in diverse educational contexts. Overall, this protocol study contributes to more effective and sustainable long-term training, ensuring that the programme’s objectives are achieved in both teaching practices and student learning.

Study 4: The final study of this Doctoral Thesis shows the effectiveness of the “MotivaDosEF” training programme, grounded in the circumplex model and SDT. This programme positively impacts teachers’ (de)motivating teaching styles and approaches, their motivational processes, and various work-related outcomes. Additionally, it confirms that the training received by teachers directly influences students’ motivational processes and various outcomes related to PE and extracurricular contexts (e.g., PA intention). This study highlights the importance of equipping teachers not only with strategies that promote motivating approaches, such as participative, attuning, guiding,

and clarifying, but also with awareness of the need to reduce the use of demotivating approaches, such as demanding, domineering, abandoning, and awaiting. Furthermore, relying on contemporary scientific literature through tools such as observation, individualised mentoring, programme adaptation to teachers' specific needs, the use of videos and practical examples, and a training style aligned with SDT principles are key strategies for achieving the significant benefits observed in "MotivaDosEF". These elements are essential to creating a motivating and supportive classroom environment that enhances both teachers' and students' motivational and psychological processes. This training approach has the potential to transform the overall educational experience, leading to improved motivational outcomes and superior performance for both students and teachers.

7. Aportaciones Principales

7. Aportaciones Principales

Este apartado presenta las principales aportaciones teóricas y prácticas de esta Tesis Doctoral, derivadas de los cuatro estudios que la componen. Se detallan exhaustivamente las contribuciones de cada estudio, así como las implicaciones generales del proyecto en su conjunto.

En relación con el Estudio 1, se ha corroborado la relevancia de los factores sociodemográficos y personales de los docentes de EF en su proceso motivacional y en la interacción con el alumnado. Este estudio destaca, a un nivel más práctico, la necesidad de incorporar estas diferencias individuales en el diseño de programas formativos, con el objetivo de atender a las características y necesidades específicas de cada docente. Además, desde una perspectiva más teórica, se ha testado por primera vez un modelo teórico basado en la TAD desde la perspectiva de los docentes de EF, el cual incluía los ocho enfoques del modelo circular. Este modelo teórico pone de manifiesto la influencia directa de las NPB y la calidad de la motivación hacia la enseñanza en el estilo motivacional que los docentes adoptan en sus clases de EF. Así, se confirma la importancia de la satisfacción de las NPB en el desarrollo de una motivación autónoma y, en consecuencia, en la implementación de estilos motivadores que promuevan el apoyo a la autonomía y la estructura. En cambio, la frustración de las NPB predice formas más controladas de motivación o incluso desmotivación, lo que impulsa el uso de estilos controladores y caóticos. Desde una perspectiva práctica, los hallazgos de este modelo teórico son útiles para definir estrategias motivacionales más efectivas y personalizadas según el perfil del profesorado, con el objetivo de mejorar su estilo motivacional docente.

Una vez validado el modelo teórico inicial, el siguiente paso consistió en acercarse más a la realidad profesional de los docentes, adoptando un enfoque metodológico centrado en la persona, específicamente en los docentes, en lugar de centrarse solo en las variables. Este cambio respondía a la evidencia de estudios previos, que indicaban que los docentes podían combinar simultáneamente distintos tipos de motivación y emplear diferentes estilos motivacionales en sus clases. Desde un punto de vista teórico, el Estudio 2 amplía la evidencia científica en el ámbito de la EF, dado que es el primero en demostrar que el profesorado de EF puede combinar diferentes niveles de los enfoques de apoyo a la autonomía (i.e., participativo y adaptativo), estructura (i.e., orientador y clarificador) y control (i.e., demandante y dominador). Este estudio

refuerza la idea de que aquellos docentes que combinan altos niveles de apoyo a la autonomía y estructura, junto con bajo control, experimentan un proceso motivacional de mayor calidad y mejores resultados laborales. En cambio, los docentes que muestran niveles moderados o altos de estructura y control, junto con bajos niveles de apoyo a la autonomía, reportan un proceso motivacional más deficiente y resultados laborales negativos. Este estudio también identifica que los docentes que combinan altos niveles de los tres estilos (apoyo a la autonomía, estructura y control), aunque tengan altos niveles en estilos motivadores, muestran un perfil de mayor riesgo debido a la presencia de razones controladas o desmotivación, lo que a largo plazo puede afectar negativamente su rendimiento profesional y satisfacción laboral. En términos prácticos, es fundamental que los docentes combinen el apoyo a la autonomía de los estudiantes (e.g., otorgar responsabilidades y atender a sus intereses) con la provisión de estructura (e.g., feedback individualizado y objetivos claros), evitando el control (e.g., prescribir conductas y avergonzar a los estudiantes) para evitar los efectos negativos en la motivación y los resultados laborales, lo que afectará indirectamente a sus estudiantes.

Tras establecer ciertas bases teóricas con los estudios 1 y 2, el siguiente paso fue diseñar el programa formativo “MotivaDosEF” para los docentes de EF. El objetivo principal de este programa fue promover un mayor uso de enfoques motivadores de enseñanza (i.e., participativo, adaptativo, orientador y clarificador), al mismo tiempo que se proporcionaban estrategias para reducir el uso de enfoques desmotivadores (i.e., demandante, dominador, de abandono y a la espera). Así, una de las principales aportaciones teóricas y prácticas de esta Tesis Doctoral es el diseño del programa formativo “MotivaDosEF”, el primero basado íntegramente en el modelo circular, considerando sus cuatro estilos y ocho enfoques motivacionales, con el objetivo de mejorar el estilo motivacional docente. A nivel teórico, el Estudio 3 proporciona una descripción detallada de este programa, destacando sus fundamentos conceptuales y la importancia de emplear una metodología rigurosa para evaluar sus efectos. Además, este estudio resalta tres puntos clave: 1) la importancia de obtener datos desde múltiples fuentes (docentes y alumnado) y a través de diferentes metodologías (cuantitativa y observacional) para obtener una visión más completa de la realidad docente; 2) el valor de un diseño cuasi-experimental y longitudinal, que proporciona mayor robustez a la evidencia y permite adaptar el programa en función de las necesidades; y 3) la combinación de sesiones grupales con sesiones individuales de reflexión, ofreciendo un espacio de mejora personal para cada docente. A nivel práctico, especialmente, este

protocolo permite que el programa se pueda replicar o adaptar en diversos contextos educativos.

El Estudio 4 continúa con las aportaciones teóricas y prácticas del diseño del protocolo descrito en el Estudio 3. A nivel teórico, este estudio reafirma la importancia de apoyarse en un marco teórico sólido y contrastado (i.e., TAD y modelo circular) para diseñar programas de formación efectivos para docentes de EF. El estudio destaca la relevancia de que los docentes adopten un estilo de enseñanza que combine el apoyo a la autonomía con la provisión de estructura. Asimismo, es esencial que los docentes adquieran estrategias efectivas para reducir el uso de enfoques controladores y caóticos en sus clases. Estas mejoras no solo impactarán positivamente en los estudiantes, sino también en el desarrollo profesional y personal de los propios docentes. Una de las contribuciones más relevantes del análisis de los efectos del programa “MotivaDosEF” es la transparencia y visibilidad de las estrategias empleadas para transformar el perfil docente de los participantes, demostrando la eficacia del programa en alcanzar sus objetivos formativos. A nivel práctico, el estudio subraya la importancia de tomar en consideración el programa “MotivaDosEF” para futuros diseños de programas formativos, ya sea replicándolo, o adaptándolo a las características y al contexto poblacional al que vaya dirigido. Además, resalta la importancia de una formación integral, adaptada a las necesidades individuales de los docentes, basada en estrategias probadas para garantizar su efectividad en contextos educativos reales.

Finalmente, es importante subrayar que esta Tesis Doctoral ha realizado contribuciones significativas a la evidencia científica, al abordar de manera integral los factores que influyen en el estilo motivacional de los docentes de EF y como este provoca diferentes resultados, tanto a nivel personal como en sus estudiantes. Partiendo de un enfoque teórico, se validó un modelo mediante un SEM, para posteriormente analizar cómo los estilos docentes se combinan, creando perfiles diferenciados, y observar los efectos de cada uno de estos perfiles. Finalmente, se ha llevado la investigación al plano aplicado, verificando la viabilidad de estas evidencias en un contexto educativo real. Con ello, se han aportado nuevas evidencias que permiten cerrar una importante brecha en la investigación sobre el proceso y el estilo motivacional de los docentes de EF, ofreciendo un panorama más completo y coherente sobre su impacto en el contexto educativo actual.

8. Referencias Bibliográficas

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Anexos

Anexos

Anexo 1. Aprobación del Comité Ético



VICERRECTORADO DE INVESTIGACIÓN Y TRANSFERENCIA

Campus Universitario
Avda de Elvas, s/n
06006 - BADAJOZ

Tel.: 924 28 93 05
Fax: 924 27 29 83

NºRegistro: 153//2022

D. JOÃO NUNO MEIRELES DA SILVA GONÇALVES RIBEIRO, SECRETARIO DE LA COMISIÓN DE BIOÉTICA Y BIOSEGURIDAD DE LA UNIVERSIDAD DE EXTREMADURA

INFORMA: Que una vez analizada por esta Comisión, en su sesión celebrada el 28/09/2022, la solicitud de Proyecto de Investigación titulado **“Evaluación y optimización de las conductas docentes en Educación Física para mejorar los procesos motivacionales y niveles de Actividad Física del alumnado (Proyecto EFyAF)”**, cuyo Investigador Principal es D. Juan José Pulido González, ha decidido por unanimidad, valorar positivamente el precitado proyecto por considerar que se ajusta a las normas éticas esenciales cumpliendo con la normativa vigente al efecto.

Y para que conste y surta los efectos oportunos firmo el presente informe.

MEIRELES DA
SILVA GONCALVES
RIBEIRO JUAN
NUNO -
08844642S

Firmado digitalmente
por MEIRELES DA
SILVA GONCALVES
RIBEIRO JUAN NUNO -
08844642S
Fecha: 2022.09.30
08:30:53 +02'00'

DE FRANCISCO
MORCILLO
JAVIER -
28946338X

Firmado digitalmente por DE
FRANCISCO MORCILLO JAVIER -
28946338X
Nombre de reconocimiento (DN):
c=ES,
serialNumber=IDCES-28946338X,
givenName=JAVIER, sn=DE
FRANCISCO MORCILLO, cn=DE
FRANCISCO MORCILLO JAVIER -
28946338X
Fecha: 2022.09.30 09:12:29 +02'00'

V.º B.º

Fdo.: Javier de Francisco Morcillo
Presidente por delegación de la
Comisión de Bioética y Bioseguridad

Anexo 2. Documento Informativo para los Docentes de Educación Física

Título de la investigación: Evaluación de las conductas docentes del profesorado aragonés de Educación Física y su incidencia sobre la motivación y el rendimiento profesional.

Investigadores Principal: Javier García Cazorla, Luis García-González y Ángel Abós Catalán

Email: j.garcia@unizar.es

Centro responsable: Universidad de Zaragoza

1. Introducción

Nos dirigimos a usted, como docente de Educación Física, con el fin de que participe en un proyecto de investigación realizado por la Universidad de Zaragoza, enmarcado en un proyecto I+D+i (Financiado por el Ministerio de Educación y Formación Profesional y el Gobierno de Aragón).

Su participación es voluntaria, pero verdaderamente importante para conocer la realidad educativa actual en Educación Física.

Antes de aceptar y firmar el documento es importante que, lea completamente este documento informativo, entienda su información, realice todas las cuestiones necesarias, medite su decisión y, finalmente, en caso de aceptar, firme el consentimiento informado.

2. ¿Quiénes somos?

Detrás del proyecto está un equipo de profesores pertenecientes al Grupo de Investigación EFYPAF (Educación Física y Promoción de la Actividad Física) de la Universidad de Zaragoza:

1. Luis García González. Profesor de la Universidad de Zaragoza.
2. Ángel Abós Catalán. Profesor de la Universidad de Zaragoza.

3. ¿Quiénes implica mi participación?

En caso de aceptar, se compromete a rellenar una encuesta sobre sus formas de comportarse en el aula en diferentes momentos, con una duración aproximada de unos 25 minutos.

A nivel ético, el Proyecto cuenta con el visto bueno del Comité de Ética de la Universidad de Extremadura.

4. ¿Cuál es el objetivo del estudio?

Conocer, comprender y analizar como la motivación de los docentes hacia la enseñanza y otras variables sociodemográficas y personales influyen en su forma de dar clase.

5. ¿Qué beneficios obtendrá al participar?

A cada uno de los docentes participantes, se les dará un informe individualizado con su perfil docente, con algunos consejos de mejora.

Esperamos que la propuesta les resulte de su interés y acepten la participación en el estudio. Así, estarán contribuyendo al desarrollo científico vinculado a las clases de EF, con el objetivo de que este tenga un impacto en su motivación, en su satisfacción laboral y rendimiento profesional. Si desean ampliar más información, ya sea del estudio o del tratado de datos, no duden en ponerse en contacto con nosotros.

Anexo 3. Consentimiento Informado para Docentes de Educación Física

Nos dirigimos a usted porque queremos llevar a cabo un estudio para el que nos gustaría solicitar su colaboración como docente de Educación Física.

El objetivo del estudio es conocer y analizar que variables motivacionales y personales influyen en la forma de dar las clases como docentes de Educación Física, así como las consecuencias que estas tienen en el profesorado hacia su profesión.

Para facilitar la toma de datos y enriquecer el proceso de investigación sería necesario recoger la información por medio de una breve encuesta, la cual se realizaría online.

El tratamiento de los datos se realizará con total rigor científico y éstos serán totalmente anónimos y, por supuesto, tratados según la ley vigente en España que rige la obtención de datos para llevar a cabo investigaciones. Además, ponemos a disposición del docente el cuestionario para que pueda ser conocido de antemano para valorar la posibilidad o no de realizarlo.

Pensamos que esta investigación puede ser interesante para recopilar información que sirva para mejorar las estrategias de actuación del profesorado de Educación Física. Por ello, solicitamos su consentimiento para participar en este estudio. Si tiene alguna duda al respecto, pónganse en contacto con nosotros a través de j.garcia@unizar.es del responsable del proyecto de investigación.

Agradecemos de antemano su colaboración y les enviamos un cordial saludo.

Yo.....com
o docente de Educación Física en el
centro.....

SI NO AUTORIZO mi participación en este estudio (marque con un círculo).

FIRMA:

Agradecemos su atención, un cordial saludo.

Atentamente,

Grupo de Investigación EFYPAF

Departamento de Expresión Musical, Plástica y Corporal

Facultad de Ciencias de la Salud y el Deporte

Correo electrónico: j.garcia@unizar.es

Anexo 4. Cartel Informativo del Programa Formativo MotivaDosEF



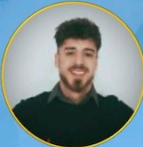
MotivaDosEF

CURSO DE ESTRATEGIAS MOTIVACIONALES EN EDUCACIÓN FÍSICA

17-24-31 DE ENERO
17:00-19:00 PM

UNIVERSIDAD DE ZARAGOZA,
FACULTAD DE EDUCACIÓN
C. DE PEDRO CERBUNA, 12, 50009
ZARAGOZA

Impartido por profesorado de la Universidad de Zaragoza (Grupo de Investigación EFYPAF)



Javier García Cazorla



Luis García González



Ángel Abós Catalán

Organizado por:



Financiado por:



Colaboran:





Haz click para más:
[Información](#) e [inscripciones](#) (gratis)
hasta el **24 de noviembre**
o póngase en contacto con:
motivadosesf@outlook.com

Anexo 5. Documento Informativo para Docentes del Grupo Experimental

“MotivaDosEF”: Información del grupo experimental”

¿Qué es “MotivaDosEF”?

“MotivaDosEF” es una acción enmarcada en un Proyecto Nacional I+D+i (Financiado por el Ministerio de Educación y Formación Profesional y el Gobierno de Aragón).

¿Quiénes somos?

Detrás de “MotivaDosEF” está un equipo de profesores pertenecientes al Grupo de Investigación EFYPAF (Educación Física y Promoción de la Actividad Física) de la Universidad de Zaragoza:

Luis García González. Profesor de la Universidad de Zaragoza.

Ángel Abós Catalán. Profesor de la Universidad de Zaragoza.

Javier García Cazorla. Profesor en la Universidad de Zaragoza.

El objetivo de “MotivaDosEF” es optimizar las estrategias motivacionales del profesorado de Educación Física (EF). Con el propósito de conocer el efecto de “MotivaDosEF” en el alumnado y en el propio profesorado, se llevará a cabo una acción formativa con una muestra aleatoria de 10 profesores de EF (grupo experimental) durante el mes de enero de 2024, que implicará a más de 1000 estudiantes de Educación Secundaria de Aragón.

¿Cuál es mi rol en “MotivaDosEF”?

Para poder llevar a cabo el programa formativo, se necesitan una serie de docentes de EF que cumplan con los requisitos de un grupo experimental, los cuales recibirán la formación para luego tratar de aplicarla en sus clases de EF. Para ello, nos gustaría solicitar su colaboración en dicho estudio.

¿Qué implica mi participación como grupo experimental?

La participación como grupo control es sencilla y consiste en los dos siguientes compromisos:

1. El docente de EF implicado cumplimentará un cuestionario sobre su visión de las clases de EF en tres momentos temporales durante el curso 2023/2024 (diciembre, abril y junio).
2. El docente de EF implicado deberá seleccionar a 2 de sus grupos en los que imparta clase para administrar un cuestionario en el que se le preguntará al alumnado sobre su visión de las clases de Educación Física en tres momentos

temporales durante el curso 2023/2024 (diciembre, abril y junio).

3. Se grabarán al menos dos clases del docente de EF implicado en dos momentos diferentes durante el curso 2023/2024 (abril y junio). Las grabaciones son únicamente con fines de investigación y no se publican ni se difunden por ningún lado.
4. Además, cada docente implicado, tendrá que participar en las tres sesiones de formación presenciales, además de las dos mentorías individualizadas para completar el curso. Estos cuestionarios se adjuntan en este mismo correo por si se desean consultar. A nivel ético, el Proyecto cuenta con el visto bueno del Comité de Ética de la Universidad de Extremadura. Los datos obtenidos serán anónimos y únicamente serán utilizados con fines de investigación. El equipo de “MotivaDosEF” guiará la cumplimentación de los cuestionarios.

¿Qué beneficios obtengo de participar el estudio?

1. A cada docente implicado en el estudio como grupo experimental, se le facilitará un perfil individualizado de su estilo docente, destacando sus puntos fuertes y sugiriendo estrategias para mejorar su impacto sobre la motivación y el aprendizaje del alumnado.
2. A cada docente implicado y a su Departamento de EF se le facilitará un “dossier con estrategias motivacionales” basadas en la investigación realizada para aplicar en las clases.

Esperamos que la propuesta les resulte de su interés y acepten la participación en el estudio. Así, estarán contribuyendo al desarrollo científico vinculado a las clases de EF, con el objetivo de que este tenga un impacto en la motivación del alumnado, en su aprendizaje y en la adquisición de un estilo más activo. Si desean ampliar más información: motivadoséf@outlook.com.

Anexo 6. Documento Informativo para los Docentes del Grupo Control

“MotivaDosEF”: Información del grupo control”

¿Qué es “MotivaDosEF”?

“MotivaDosEF” es una acción enmarcada en un Proyecto Nacional I+D+i (Financiado por el Ministerio de Educación y Formación Profesional y el Gobierno de Aragón).

¿Quiénes somos?

Detrás de “MotivaDosEF” está un equipo de profesores pertenecientes al Grupo de Investigación EFYPAF (Educación Física y Promoción de la Actividad Física) de la Universidad de Zaragoza:

3. **Luis García González.** Profesor de la Universidad de Zaragoza.
4. **Ángel Abós Catalán.** Profesor de la Universidad de Zaragoza.
5. **Javier García Cazorla.** Profesor en la Universidad de Zaragoza.

¿En qué consiste “MotivaDosEF”?

El objetivo de “MotivaDosEF” es optimizar las estrategias motivacionales del profesorado de Educación Física (EF). Con el propósito de conocer el efecto de “MotivaDosEF” en el alumnado y en el propio profesorado, se llevará a cabo una acción formativa con una muestra aleatoria de 20 profesores de EF (grupo experimental) durante el mes de enero de 2024, que implicará a más de 1000 estudiantes de Educación Secundaria de Aragón.

¿Cuál es mi rol en “MotivaDosEF”?

Si bien este grupo experimental es importante, a nivel metodológico es igual de importante tener un grupo de profesores paralelo que sirvan como grupo control. Para ello, nos gustaría solicitar su colaboración en dicho estudio.

¿Qué implica mi participación como grupo control?

La participación como grupo control es sencilla y consiste en los dos siguientes compromisos:

1. El docente de EF implicado, cumplimentará un cuestionario sobre su visión de las clases de EF en tres momentos temporales durante el curso 2023/2024 (diciembre, abril y junio).
2. El docente de EF implicado, deberá seleccionar a 2 de sus grupos en los que imparta clase para administrar un cuestionario en el que se le preguntará al alumnado sobre su visión de las clases de Educación Física en tres momentos temporales durante el curso

2023/2024 (diciembre, abril y junio).

Estos cuestionarios se adjuntan en este mismo correo por si se desean consultar. A nivel ético, el Proyecto cuenta con el visto bueno del Comité de Ética de Investigación del Gobierno de Aragón. Los datos obtenidos serán anónimos y únicamente serán utilizados con fines de investigación. El equipo de “MotivaDosEF” guiará la cumplimentación de los cuestionarios.

¿Qué beneficios obtengo de participar el estudio?

1. A cada docente implicado en el estudio como grupo control, se le facilitará un perfil individualizado de su estilo docente, destacando sus puntos fuertes y sugiriendo estrategias para mejorar su impacto sobre la motivación y el aprendizaje del alumnado.
2. A cada docente implicado y a su Departamento de EF se le facilitará un “dossier con estrategias motivacionales” basadas en la investigación realizada para aplicar en las clases de EF.
3. A cada docente implicado en el estudio, así como a sus compañeros de departamento (si así lo desean), se les ofrecerá un taller formativo de 4 horas similar al que recibirá el grupo experimental. Esta acción se llevará a cabo una vez realizado el estudio.

Esperamos que la propuesta les resulte de su interés y acepten la participación en el estudio. Con su colaboración, estarán contribuyendo al desarrollo científico vinculado a las clases de EF, con el objetivo de que este tenga un impacto en la motivación del alumnado, en su aprendizaje, y en su adopción de un estilo de vida más activo y saludable. Si desean ampliar más información: motivadossef@outlook.com.

Anexo 7. Consentimiento Informado para Docentes de Educación Física del Programa Formativo

Nos dirigimos a usted porque queremos llevar a cabo un estudio para el que nos gustaría solicitar su colaboración como docente de Educación Física.

El objetivo del estudio es analizar que conductas docentes del profesorado de Educación Física generan consecuencias más positivas en los/as niños/as de Educación Secundaria, como el aprendizaje percibido y las experiencias en las clases. Estas respuestas, ayudarán a optimizar la calidad de la enseñanza de la Educación Física.

Para facilitar la toma de datos y enriquecer el proceso de investigación sería necesario recoger la información por medio de cuestionarios y grabación de dos clases durante el presente curso, los cuales sería administrados por el docente inscrito en el programa formativo y los responsables de este.

El tratamiento de los datos se realizará con total rigor científico y éstos serán totalmente anónimos y, por supuesto, tratados según la ley vigente en España que rige la obtención de datos para llevar a cabo investigaciones. Además, ponemos a disposición del docente el cuestionario para que pueda ser conocido de antemano para valorar la posibilidad o no de realizarlo.

Pensamos que esta investigación puede ser interesante para recopilar información que sirva para mejorar las estrategias de actuación del profesorado de Educación Física, lo que repercutirá en las experiencias del alumnado para tener una vida más activa. Por ello, solicitamos su consentimiento para participar en este estudio. Si tiene alguna duda al respecto, pónganse en contacto con nosotros a través de j.garcia@unizar.es.

Agradecemos de antemano su colaboración y les enviamos un cordial saludo.

Yo.....com
o docente de Educación Física en el
centro.....

SI NO AUTORIZO mi participación en este estudio (marque con un círculo).

FIRMA:

Agradecemos su atención, un cordial saludo.

Atentamente,

Grupo de Investigación EFYPAF

Departamento de Expresión Musical, Plástica y Corporal

Facultad de Ciencias de la Salud y el Deporte

Anexo 8. Consentimiento Informado para los Centros Educativos

A la dirección del centro educativo:

Nos dirigimos a usted porque queremos llevar a cabo un estudio para el que nos gustaría solicitar la colaboración de su centro escolar. El objetivo del estudio es conocer y analizar que conductas docentes del profesorado de Educación Física generan consecuencias más positivas en los/as niños/as de Educación Secundaria, como el aprendizaje percibido y las experiencias en las clases. Estas respuestas, ayudarán a optimizar la calidad de la enseñanza de la Educación Física. Para facilitar la toma de datos y enriquecer el proceso de investigación sería necesario recoger la información por medio de cuestionarios y grabación de dos clases durante el presente curso, los cuales sería administrados por el docente inscrito en el programa formativo y los responsables de este. El tratamiento de los datos se realizará con total rigor científico y éstos serán totalmente anónimos y, por supuesto, tratados según la ley vigente en España que rige la obtención de datos para llevar a cabo investigaciones. Los familiares de los estudiantes deberán de firmar un consentimiento para dar o no autorización a fin de que sus hijos e hijas formen parte del estudio. Además, ponemos a disposición del centro el cuestionario para que pueda ser conocido de antemano para valorar la pertinencia o no de ser administrado en su centro. Pensamos que esta investigación puede ser interesante para recopilar información que sirva para mejorar las estrategias de actuación del profesorado de Educación Física, lo que repercutirá en las experiencias del alumnado para tener una vida más activa. Por ello, solicitamos su consentimiento para que el centro participe en el estudio. Si tienen alguna duda al respecto, pónganse en contacto con nosotros a través de motivadosef@outlook.com

Agradecemos de antemano su colaboración y les enviamos un cordial saludo.

Yo.....com
o responsable del centro educativo.....

SI NO AUTORIZO que mis estudiantes participen en este estudio (marque con un círculo).

FIRMA: Agradecemos su atención, un cordial saludo.

Atentamente,

Grupo de Investigación EFYPAF

Departamento de Expresión Musical, Plástica y Corporal

Correo electrónico: j.garcia@unizar.es

Anexo 9. Documento Informativo para Familias

“MotivaDosEF”: Información del programa formativo

¿Qué es “MotivaDosEF”?

“MotivaDosEF” es una acción enmarcada en un Proyecto Nacional I+D+i (Financiado por el Ministerio de Educación y Formación Profesional y el Gobierno de Aragón).

¿Quiénes somos?

Detrás de “MotivaDosEF” está un equipo de profesores pertenecientes al Grupo de Investigación EFYPAF (Educación Física y Promoción de la Actividad Física) de la Universidad de Zaragoza:

Luis García González. Profesor de la Universidad de Zaragoza.

Ángel Abós Catalán. Profesor de la Universidad de Zaragoza.

Javier García Cazorla. Profesor en la Universidad de Zaragoza.

El objetivo de “MotivaDosEF” es optimizar las estrategias de enseñanza del profesorado de Educación Física (EF). Con el propósito de conocer el efecto de “MotivaDosEF” en el alumnado y en el propio profesorado, se llevará a cabo una acción formativa con una muestra aleatoria de docentes de EF durante el mes de enero de 2024, que implicará a más de 1000 estudiantes de Educación Secundaria de Aragón.

¿Cuál es mi rol en “MotivaDosEF”?

Para poder llevar a cabo el programa formativo, se necesita un gran número de estudiantes de secundaria, los cuales serán enseñados por docentes los cuales participarán en este programa formativo. Para ello, nos gustaría solicitar la colaboración de sus jóvenes familiares en este estudio.

¿Qué implica mi participación como grupo experimental?

La participación como estudiante es sencilla y consiste en los dos siguientes compromisos:

1. El estudiante deberá de realizar una encuesta en tres momentos diferentes del curso académico, analizando cómo su docente de EF se comporta en determinadas situaciones durante las clases.
2. Se realizarán grabaciones en dos momentos diferentes de dos clases de Educación Física para analizar el comportamiento de los docentes durante sus clases. Las grabaciones son únicamente con fines de investigación y no se publican ni se difunden

por ningún lado.

Los cuestionarios se adjuntan en este mismo correo por si se desean consultar. A nivel ético, el Proyecto cuenta con el visto bueno del Comité de Ética de la Universidad de Extremadura. Los datos obtenidos serán anónimos y únicamente serán utilizados con fines de investigación. El equipo de “MotivaDosEF” guiará la cumplimentación de los cuestionarios.

¿Qué beneficios obtienen los estudiantes?

1. A cada docente implicado en el estudio como grupo experimental, se le facilitará un perfil individualizado de su estilo docente, destacando sus puntos fuertes y sugiriendo estrategias para mejorar su impacto sobre la motivación y el aprendizaje del alumnado, lo que a la larga beneficiará a los estudiantes.

2. A cada docente implicado y a su Departamento de EF se le facilitará un “dossier con estrategias motivacionales” basadas en la investigación realizada para aplicar en las clases, lo que también beneficiará a la calidad de las clases de sus familiares.

Esperamos que la propuesta les resulte de su interés y acepten la participación de sus hijos e hijas en el estudio. Así, estarán contribuyendo al desarrollo científico vinculado a las clases de EF, con el objetivo de que este tenga un impacto en la motivación del alumnado, en su aprendizaje y en la adquisición de un estilo más activo. Si desean ampliar más información: motivadoséf@outlook.com.

Anexo 10. Consentimiento Informado para Familias

Estimados padres/madres/tutores legales:

Me dirijo a ustedes ya que queremos llevar a cabo un estudio con el alumnado de Educación Secundaria de Aragón, bajo la supervisión de la Universidad de Zaragoza. El objetivo de dicho estudio será analizar qué conductas docentes del profesorado de Educación Física generan consecuencias más positivas en los/as niños/as, como el aprendizaje percibido y las experiencias en las clases. Estas respuestas, ayudarán a optimizar la calidad de la enseñanza de la Educación Física. Si ofrece su consentimiento, la participación de su hijo/a en este estudio consistiría en cumplimentar unos cuestionarios sobre sus experiencias en Educación Física, los cuales habrán sido supervisados previamente por el equipo directivo del centro.

La participación de su hijo/a será voluntaria. El tratamiento de los datos se realizará con total rigor científico y éstos serán totalmente anónimos y, por supuesto, tratados según la ley vigente en España que rige la obtención de datos para llevar a cabo investigaciones. Esta investigación puede ser interesante para recopilar información que sirva para mejorar las estrategias de actuación del profesorado de Educación Física, lo que repercutirá en las experiencias del alumnado para tener una vida más activa. Por ello, solicito su consentimiento para que su hijo/a participe en el estudio. Para no ocasionarle molestias, usted únicamente deberá firmar este documento y hacérselo llegar a través de su hijo/a. Si tienen alguna duda, pueden ponerse en contacto con el responsable académico de la Universidad de Zaragoza (Luis García González, email: lgarciag@unizar.es/Javier García Cazorla, email: j.garcia@unizar.es). A continuación, complete la siguiente información independientemente de si ofrece su consentimiento o no.

Yo.....com
o padre/madre/tutor legal del
alumno/a.....

SI **NO** **AUTORIZO** que mi hijo/a participe en este estudio (marque con un círculo).

FIRMA:

Agradecemos su atención, un cordial saludo.

Atentamente,

Grupo de Investigación EFYPAF

Departamento de Expresión Musical, Plástica y Corporal

Correo electrónico: j.garcia@unizar.es

