STUDIA UBB EDUCATIO ARTIS GYMN., LXIX, 4, 2024, pp. 47-62
(RECOMMENDED CITATION)
DOI:10.24193/subbeag.69(4).29

INTRINSIC MOTIVATIONAL CLIMATE AND PHYSICAL ACTIVITY LEVELS OF FEMALE STUDENTS IN BUDAPEST, HUNGARY

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Article history: Received: 2024 November 18; Revised 2025 January 08; Accepted 2025 January 10; Available online: 2025 February 10; Available print: 2025 February 28

ABSTRACT. Motivation is a vital determinant in sustaining physical activity (PA). Motivation influences not only PA participation but also serves as a crucial determinant of exercise adherence. The study of motivational processes in sports for adolescents is crucial because, according to the World Health Organization, globally, 81% of adolescents aged 11-17 years were insufficiently physically active in 2022. The present research aimed to investigate a) the relationship of the variables of IMCPEQ [intrinsic motivational climate of PE lessons questionnaire] with PA of Hungarian female students and b) the differences concerning motivational components of students' PA. A sample of 325 Hungarian female students from nine schools aged 13–15 (mean age = 14.07; SD = 0.87) was used. They responded to the questionnaires online. Pearson correlation coefficient and one-way ANOVA were performed to identify the relationship and differences between variables. Findings indicated a significant positive relationship between PA levels and Task-involving climate, Social-relatedness supporting climate, Autonomy-supporting climate, Enjoyment, and Physical activity. No relationship was present between Ego/competitive climate variable and PA levels. Moreover, the intrinsic motivational climate in physical education (PE) significantly influenced differences in PA levels among female students. Post hoc test with Bonferroni corrections' results indicated significant differences in the variables. To summarize, IMCPEQ, as analysed by the Self-determination Theory and Achievement Goal Theory, encouraged physical activity.

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According to the study results and based on the higher mean of the task-involving climate, students' personal development, objectives, and expertise in skills should be emphasized.

Keywords: *Intrinsic Motivational Climate, Physical Activity Levels, female students in Budapest*

PREFACE

This study can be considered a continuation of the article published in the Hungarian Review of Sport Science (Ghazvini et al., 2024) since the processing of the topic differs only in that while the first one is Iranian, the latter presents the test results of Hungarian students. In itself, the separate analysis of the data of these two countries is an instructive scientific result, at the same time, according to our plans, in a future paper we will also compare the student data and examine their correlations.

INTRODUCTION

The World Health Organization (WHO) recommends at least 60 minutes of moderate to vigorous-intensity physical activity (PA) per day for children and adolescents aged 5 to 17 years (WHO, 2022). Nonetheless, 81% of adolescents globally, aged 11 to 17, were physically inactive. Adolescent girls were less active than adolescent boys, with 85% vs. 78% not meeting WHO recommendations of at least 60 minutes of moderate to vigorous intensity physical activity per day. Given the limited rate of physical activity observed among adolescents and the decline in activity levels compared with boys, there is a considerable focus on prioritizing the promotion of PA, especially aimed at girls (Camacho-Minano et al., 2011). The decline in physical activity is evident in both genders but becomes more apparent in girls and increases with age (Sherar et al., 2007). Diverse environments have been utilized to promote physical activity among youth; the most effective interventions have been implemented in the school environment (Edwardson et al., 2015). Physical education (PE) classes are frequently the initial exposure to PA for most children (Hoare and Somerset, 2018). School physical education substantially influences the development of a mindset conducive to enduring physical activity. This is because it is implemented

by qualified educators, who facilitate the development of consistent positive experiences of physical activity among the school-age population (Sallis et al., 2012).

Motivation is a primary important element associated with engagement in physical activities from the early years of life (Hagger & Chatzisarantis, 2007). Motivation is a cognitive process that initiates and sustains goal-directed behaviours (Pintrinch & Schunk, 2002). Motivation is the energy that motivates people to engage in physical or mental activities directed toward particular targets or objectives. The theoretical framework commonly employed to examine motivation in physical education comprises two principal theories: Self-determination Theory (Deci & Ryan, 1985) and Achievement goal Theory (Nicholls, 1989).

The self-determination theory posits that autonomy, competence, and relatedness are the essential variables of psychological well-being and effective functioning. Conditions that fulfil these three requirements positively influence well-being. In contrast, conditions that restrict or slow down the fulfilment of these needs can adversely affect people's behaviour and well-being. Each of these needs is fundamental, and failure to fulfil any of them may result in negative motivational outcomes (Deci & Ryan, 1985; 2000). In 1991, Deci and Ryan defined the need for autonomy as people's attempts to control their own behaviours. The need for competence was expressed as persons seeking to achieve a sense of efficacy. Finally, the need for relatedness was characterised as people's attempts to develop a satisfying and harmonious relationship with others.

Achievement goal theory (Nicholls, 1989) is another well-known theory in the field of research on motivational variables influencing children and adolescents. Achievement goal theory encompasses two goal perspectives: task (self-referenced) and ego (other-referenced), which are important in performance contexts. These orientations are related to the assessment of competence and success, and they are associated with significant behavioural variations (Nicholls, 1989).

Regarding the framework of Achievement goal Theory, the motivational climate is a vital element related to a situational psychological perception of the activity, guiding the objectives of action (Ames, 1992). The investigation of motivational climate's influence on physical activity in children and adolescents has been identified as one of the ten most significant research inquiries in physical education (Chen, 2013). The motivational climate in school physical education influences students' self-perception, motivation, and attitudes toward participation in PA. The social context established by significant people varies on the emphasised achievement goals (Duda & Balaguer, 2007). According to the scope of achievement

goal orientation, the motivational climate has two perspectives: a task-involving climate and an ego-involving climate. An ego-involving climate emphasises performance results and social comparisons among pupils. This results in heightened external motivation and anxiety, along with a reduced interest (Duda & Whitehead, 1998).

In a task-involving climate, students evaluate their performance based on personal development, receive praise for their efforts and attempts, and determine their objectives (Ames, 1992). Prior research has demonstrated that integrating Achievement goal Theory (Nicholls, 1989) with Self-determination Theory (Deci & Ryan, 1985) is beneficial for comprehending students' intra-individual motivation (Ciani et al., 2011; Ommundsen & Kvalø, 2007). Upon simultaneous examination of achievement goal theory and self-determination theory, it is apparent that they encompass analogous components, incorporating both social and cognitive dimensions. The principal distinction between the two theories is that the Achievement goal Theory functions solely with perceived competence, categorised into task-oriented and ego-oriented approaches. The Self-determination Theory encompasses the perception of competence, along with notions of autonomy and social relatedness as additional components.

Given the ongoing necessity to enhance the standards of physical education and develop relevant theoretical frameworks, it is crucial to evaluate attitudes towards the motivational climate within the physical education environment. Consequently, by concentrating on the Self-Determination Theory and Achievement Goal Theory, we wanted to examine the relationship between IMCPEQ variables with the physical activity levels of high school female students. Furthermore, we aimed to investigate differences in physical activity levels (low intensity, moderate intensity, and vigorous intensity) among female students and IMCPEQ variables.

METHODS

Participants and Procedures

The design was cross-sectional in the present study, carried out during the 2022-2023 academic year. Overall, the sample included 325 Hungarian female students aged 13 to 15 years old (M = 14.07; SD = 0.87). The participants were selected from nine schools that represented the wealthy, moderate-income, and low-income districts, and they were in Hungary and its suburbs. Mean height = 164.87 cm; Standard Deviation = 6.21 cm, Mean weight = 56.38 kg; Standard Deviation = 10.65 kg. 84.6% of Hungarian students lived with their

parents, with 40.6% part of four-member families. Furthermore, 92.6% had internet access via their cell phones. Regarding basic physical activity amenities, 79.4% had a garden at their home, 82.8% owned bicycles, 76.6% got skateboards, and 58.8% had skates. After receiving approval from the Hungarian University of Sports Science and the Ministry of Education in Hungary, the questionnaires were made available to volunteer students online with the endorsement of the school principals and consultation with physical education teachers. The questionnaires were translated from English to Hungarian by two professors who are experts in this subject. The Intrinsic Motivational Climate of PE Lessons Questionnaire (IMCPEQ), International Physical Activity Questionnaire (IPAQ), and General Information Demographic Data Questionnaire were completed by students online for approximately one hour. Additionally, the students were also assured that their responses would be kept confidential. For this study, an authorisation was issued from the research ethics committee of the Hungarian University of Sports Science, letter number TE-KEB/27/2022. Permission for the completion of all high school students was asked of the parents, and each participating student expressed his or her consent. Participation was entirely voluntary, and individuals had the option to withdraw from the study at any time and without explanation.

Measures

Intrinsic Motivational Climate of PE Lessons

Motivational climate was measured by using (IMCPEQ), which consists of 24 questions and four subscales: task- and ego-involving climate, autonomy support, and social relatedness. Additionally, it includes two variables, enjoyment and physical activity, which are not part of the motivational climate questionnaire (Soini et al., 2004). The ego-involving climate assesses the extent to which the class prioritizes social comparison, competition, and victory (four questions, e.g., "It is crucial for the students to outperform their peers"). The task -involving climate assesses the extent to which the physical education class prioritizes skill enhancement, effort, and self-improvement (five questions, e.g., "It is essential for students to strive to enhance their own skills"). The social relatedness assesses the extent to which students perceive a connection with their peers and teacher (four questions, e.g., "Our PE class exhibits a strong sense of unity"). The autonomy support assesses the extent to which students perceive they possess choices and control over their learning (five questions, e.g., "Students can influence the direction of PE lessons"). Each item was rated on a five-point Likert scale (1 = strongly disagree, 5 = strongly agree). The IMCPEQ was translated

into Hungarian from English by two Professors who are experts in the sport psychology field. Moreover, Cronbach's alpha coefficients were between 0.78 and 0.88.

International Physical Activity Questionnaire

The IPAQ is a standardized self-report instrument developed in 1998 by an international group of researchers from several countries. The questionnaire has seen extensive usage in several studies, and its validity and reliability have been reported (Craig et al., 2003). This self-report questionnaire serves to provide a simple, reliable, and valid instrument for assessing the level of physical activity. The short form of the IPAQ is the abbreviation of the original long form of IPAQ. It contains seven questions that measure the frequency and duration of performing physical activity in three levels of intensity, such as walking, moderate-intensity, and vigorous-intensity activities. The types of activity assessed are walking, moderate-intensity activities, and vigorous-intensity activities; frequency is measured in days per week and duration in time per day for each of these specific types of activities. The components were aimed at providing separate scores for walking, moderate-intensity, and vigorous-intensity activity, as well as a combined total score to represent the overall level of activity. Add the frequency (days) and duration (in minutes) of walking, moderate-intensity, and vigorous-intensity activity to get the overall score. Respondents need to indicate the number of days per week and the minutes spent on each activity level. Another way to calculate the volume of activity is to weight each type of activity by its energy requirements as defined in METS (METs are multiples of resting metabolic rate), resulting in a score in MET-minutes. A MET-minute is calculated by multiplying the MET score by the number of minutes done. The following values will be used to analyse IPAQ data: walking = 3.3 METs, moderate PA = 4.0 METs, and vigorous PA = 8.0 METs. The questionnaire provides estimates of the overall physical activity in metabolic equivalent minutes per week, or MET min/week, and separately the time spent in each intensity level. During the calculation of the physical activity scores, only activities that lasted at least 10 minutes at a time were considered. Physical activities are classified into three levels of response: low, moderate, and vigorous. The algorithms for the classification of the data are defined in the scoring protocol (Guidelines for Data Processing and Analysis of the IPAQ 2005). Accordingly, participants will be categorized into three groups based on the total physical activity score: "Low" when the physical activity levels are below 600 MET-minute/week; "Moderate" from 600-3000 MET-minute/week; and "Vigorous" when above 3000 MET-minute/week.

Statistical Analyses

Data processing was performed using the software IBM SPSS v. 26. Descriptive statistic indicators were reported as frequencies, mean, and standard deviation. Pearson correlation coefficient and one-way ANOVA were performed to identify the relationship and differences between variables, respectively. Moreover, post hoc test with Bonferroni corrections was used to evaluate the differences between groups. Data analyses were made at a significance level of $P \leq 0.05$.

RESULTS

Table 1 showed measurements of minimum, maximum, mean, standard deviation, and variance of research variables, including PA levels, Ego/competitive climate, Task involving climate, social relatedness supporting climate, Autonomy supporting climate, Enjoyment, and Physical Activity.

Table 1. Measurements of minimum, maximum, means, standard deviations, and variance of PA levels and IMCPEQ's variables

	PA levels	Ego/ competi-tive climate	Task involving climate	Social related-ness support-ing climate	Autonomy supporting climate	Enjoy-ment	Physical activity
Minimum	1	1	1	1	1	1	1
Maximum	3	5	5	5	5	5	5
Mean	2.45	3.08	3.77	3.21	2.95	3.37	3.47
Std. Deviation	0.72	0.86	.086	1.02	0.95	1.13	1.03
Variance	.051	.075	.075	1.05	0.90	1.29	1.07

The analysis of students' physical activity levels showed that 58.2% engaged in vigorous exercise, 28.3% in moderate activity, and 13.5% in low activity (Table 2).

Table 2. Level of Physical Activity of female students

Physical Activity Level	Frequency	Percent
Low (<600 METmin/week)	44	13.5
Moderate (600-3000 METmin/week)	92	28.3
Vigorous (>3000 METmin/week)	189	58.2
Total	325	100

For the analysis of the relationship between the level of PA and variables related to IMCPEQ, Pearson's correlation coefficient was calculated (Table 3).

This means that all the variables in IMCPEQ were correlated with the PA level except the 'Ego' variable, which did not show any relation to the PA level. The correlation between the IMCPEQ variable and the variable PA levels was generally weak, but the task variable had a relatively stronger correlation. It is expected to get even stronger with a larger population.

Table 3. Correlation between PA levels (from IPAQ variables) and IMCPEQ's variables

	1	2	3	4	5	6	7
PA levels	--------						
Ego/competitive climate	0.09	--------					
Task involving climate	0.25**	0.39**	--------				
Social relatedness supporting climate	0.17**	0.05	0.42**	--------			
Autonomy supporting climate	0.14**	0.36**	0.53**	0.41**	--------		
Enjoyment	0.18**	0.20**	0.60**	0.42**	0.51**	--------	
Physical Activity	0.16**	0.29**	0.66**	0.35**	0.44**	0.60**	--------

** correlation is significant at the 0.01 level.

To compare the differences between students' levels of physical activity and the variables of IMCPEQ, One-way ANOVA was performed, as shown in Table 4. Significant differences in the levels of students' PA were influenced by the intrinsic motivational climate in PE.

Table 4. Results of One-way analysis of variance (ANOVA)

		Sum of Squares	df	Mean Square	F	Sig.
Ego/competitive climate	Between Groups	7.25	2	3.62	4.93	0.008
	Within Groups	236.74	322	0.73		
	Total	244.00	324			
Task involving climate	Between Groups	16.19	2	8.09	11.39	0.000
	Within Groups	228.90	322	0.71		
	Total	245.10	324			
Social relatedness supporting climate	Between Groups	10.31	2	5.15	5.00	0.007
	Within Groups	331.62	322	1.03		
	Total	341.93	324			
Autonomy supporting climate	Between Groups	10.42	2	5.21	5.95	0.003
	Within Groups	281.98	322	0.87		
	Total	292.41	324			
Enjoyment	Between Groups	17.94	2	8.97	7.18	0.001
	Within Groups	402.12	322	1.24		
	Total	420.07	324			
Physical activity	Between Groups	10.98	2	5.49	5.24	0.006
	Within Groups	337.26	322	1.04		
	Total	348.25	324			

Based on Table 5, there was a significant difference in the levels of physical activity among students and IMCPEQ's variables. With the purpose of identifying the groups to which these differences are significant, a post hoc test with Bonferroni corrections was adopted. These results are reported in Table 5. It can be seen that significant differences were found between moderate and vigorous levels of physical activity for the variables of ego, task, autonomy, enjoyment, and physical activity. In addition, there were also significant differences between low and vigorous levels of physical activity in the variables of task, social, enjoyment, and physical activity. With an increase in the sample size in the study, differences in all levels of physical activity are likely to be observed.

Table 5. Post hoc test with Bonferroni corrections' results for different levels of physical activity among students

	(I) PA levels	(J) PA levels	Mean difference (I-J)	Std. Error	Sig.	Lower Bound	Upper Bound
Ego-competitive climate	Low activity levels	Moderate activity levels	0.26	0.15	0.274	-0.112	0.644
		Vigorous activity levels	-0.07	0.14	1.000	-0.420	0.270
	Moderate activity levels	Low activity levels	-0.26	0.15	0.274	-0.644	0.112
		Vigorous activity levels	-0.34*	0.10	0.006	-0.603	-0.078
	Vigorous activity levels	Low activity levels	0.07	0.14	1.000	-0.270	0.420
		Moderate activity levels	0.34*	0.10	0.006	0.078	0.603
Task involving climate	Low activity levels	Moderate activity levels	-0.169	0.15	0.823	-0.541	0.202
		Vigorous activity levels	-0.55*	0.14	0.000	-0.894	-0.215
	Moderate activity levels	Low activity levels	0.16	0.15	0.823	-0.202	0.541
		vigorous activity levels	-0.38*	0.10	0.001	-0.643	-0.127
	Vigorous activity levels	Low activity levels	0.55*	0.14	0.000	0.215	0.894
		Moderate activity levels	0.38*	0.10	0.001	0.127	0.643
Social relatedness supporting climate	Low activity levels	Moderate activity levels	-0.22	0.18	0.711	-0.668	0.227
		Vigorous activity levels	-0.48*	0.16	0.014	-0.892	-0.075
	Moderate activity levels	Low activity levels	0.22	0.18	0.711	-0.227	0.668
		vigorous activity levels	-0.26	0.12	0.126	-0.574	0.047
	Vigorous activity levels	Low activity levels	0.48*	0.16	0.014	0.075	0.892
		Moderate activity levels	0.26	0.12	0.126	-0.047	0.574
Autonomy supporting climate	Low activity levels	Moderate activity levels	0.16	0.17	1.000	-0.251	0.574
		Vigorous activity levels	-0.24	0.15	0.379	-0.617	0.136
	Moderate activity levels	Low activity levels	-0.16	0.17	1.000	-0.574	0.251

	(I) PA levels	(J) PA levels	Mean difference (I-J)	Std. Error	Sig.	Lower Bound	Upper Bound
Enjoyment	Vigorous activity levels	vigorous activity levels	-0.40*	0.11	0.002	-0.687	-0.115
		Low activity levels	0.24	0.15	0.379	-0.136	0.617
		Moderate activity levels	0.40*	0.11	0.002	0.115	0.687
	Low activity levels	Moderate activity levels	-0.00	0.20	1.000	-0.497	0.488
		Vigorous activity levels	-0.47*	0.18	0.033	-0.929	-0.029
	Moderate activity levels	Low activity levels	0.00	0.20	1.000	-0.488	0.497
		Vigorous activity levels	-0.47*	0.14	0.003	-0.816	-0.133
Physical activity	Vigorous activity levels	Low activity levels	0.47*	0.18	0.033	0.029	0.929
		Moderate activity levels	0.47*	0.14	0.003	0.133	0.816
	Low activity levels	Moderate activity levels	-0.07	0.18	1.000	-0.529	0.373
		Vigorous activity levels	-0.42*	0.17	0.043	-0.834	-0.010
	Moderate activity levels	Low activity levels	0.07	0.18	1.000	-0.373	0.529
		Vigorous activity levels	-0.34*	0.13	0.026	-0.657	-0.031
	Vigorous activity levels	Low activity levels	0.42*	0.17	0.043	0.010	0.834
		Moderate activity levels	0.34*	0.13	0.026	0.031	0.657

* The mean difference is significant at the 0.05 level.

DISCUSSION AND CONCLUSIONS

The aim of this research was to investigate associations among task and ego-involving climate, autonomy support, and social relatedness; additionally, enjoyment and physical activity, which are not part of the motivational climate questionnaire, with the physical activity levels of female students in Budapest (13-15 years old, M = 14.07; SD = 0.87) and differences in the components of IMCPEQ depending on students' physical activity levels.

The highest mean was associated with a task-involving climate, whereas the lowest was linked to an ego-involving climate. (Soini et al., 2014; Amaro et al., 2023; Jakobsen, 2023; Rodrigues et al., 2024). These findings point out that students perceive a task-involving climate more than an ego-involving climate in physical education classes. Therefore, professionals, managers, and PE teachers should focus on values referring to the development of skills and individual improvement and promote teamwork among their students while underlining the importance of every single student as part of the team. Eventually, attention should be directed to aspects reinforcing a task-involving climate during the physical education lessons to set off students' motivation to participate in physical activities. Whereas an ego-involving climate is attributed to less positive characteristics. This is supported by the research of (Chicau Borrego et al., 2021; Albert, 2022; Isoard-Gautheur et al., 2022; and McLaren et al., 2024). Pearson's correlation coefficient between the variables supported the above, where the highest correlation was that of the task-involving climate with other variables, while the lowest correlation was from the ego-involving climate with other variables. Besides, no significant correlation is found between the ego-involving climate with levels of physical activity and social relatedness; other correlations were also weak and negligible. Also, Pearson's correlation coefficient showed that all the variables of the intrinsic motivational climate of PE lessons, that is, task-involving climate, social relatedness-supporting climate, and autonomy-supporting climate, even enjoyment, and physical activity, which do not form part of the intrinsic motivational climate of the PE lessons, are in significant positive relation with the physical activity of Hungarian female students. Although the correlation at present is weak between the IMCPEQ and the PA levels variables, it was a bit stronger for the task variable. It is expected this will be considerably improved when the study population becomes larger. Theoretically, the IMCPEQ comprises three fundamental components in meeting the three psychological needs proposed in Self-determination Theory (Deci & Ryan, 2000) and Achievement Goal Theory (Nicholls, 1989): autonomy, social relatedness, and competence (task-involving climate). In this study, the internal correlations of the three factors mentioned above were moderate and positive, which indicated that the school's physical education environment was effective in meeting the above-mentioned three psychological needs. The findings of the one-way ANOVA indicated that there was a significant difference between the intrinsic motivational climate of PE lesson variables and the PA of the students. Therefore, to find out which groups these significant differences relate to, the result of the Post hoc test with Bonferroni corrections was used. Significant differences were found in variables such as ego, task, autonomy, enjoyment, and physical activity between moderate and vigorous levels of physical activity. In

addition, there were also significant differences between the low and vigorous levels for the variables of task, social, enjoyment, and physical activity. As the study population increases, differences in all physical activity levels would be more likely to be apparent. In addition, physical activity was increased with increased variables of IMCPEQ which aligns with previous studies. (Zurita-Ortega et al., 2019; Gil-Arias et al., 2020; Kokkonen et al., 2020; Berki & Tarjányi, 2022; Mouratidou et al., 2022). To summarize, IMCPEQ, as analysed by the Self-determination Theory and Achievement Goal Theory, encouraged physical activity. According to the study results and based on the higher mean and correlation of the task-involving climate, students' personal development, objectives, and expertise in skills should be emphasized.

Limitations and Future goals

Our research was correlational; therefore, no causal relationship can be established between these variables. Moreover, our research focused on Hungarian female students aged 13 to 15, and this result can be different in other societies with changes in norms, culture, values, and traditions. In addition, the male group can also differ because their activities are generally higher than those of the female group.

Further studies are encouraged, especially within other communities: male students, students at different educational levels, and non-school sports settings. The study was cross-sectional; hence, longitudinal and experimental studies may help complement the comprehensive view.

REFERENCES

Albert, E., Petrie, T. A., & G. Moore, E. W. (2022). Achievement motivation and grit's perseverance of effort among collegiate athletes. *International Journal of Sport and Exercise Psychology*, *22*, 681–696. DOI: https://doi.org/10.1080/1612197X.2022.2161100

Amaro N., et al. (2023). Task-Involving Motivational Climate and Enjoyment in Youth Male Football Athletes: The Mediation Role of Self-Determined Motivation. *International Journal of Environmental Research and Public Health*, *20*, 3044. Doi: https://doi.org/10.3390/ijerph20043044

Ames, C. (1992). *Achievement goal, motivational climate, and motivational processes.* Human Kinetics, Champaign IL, pp.161-176.

Berki, T., & Tarjányi, Z. (2022). The role of physical activity, enjoyment of physical activity, and school performance in learning motivation among high school students in Hungary. *Children (Basel)*, *9*, 320. Doi: https://doi.org/10.3390/children9030320

Camacho-Minano, M., LaVoi, N., & Barr-Anderson, D. (2011). Interventions to promote physical activity among young and adolescent girls: A systematic review. *Health Education Research*, *26*, 1025-49. Doi: 10.1093/her/cyr040

Chen, A. (2013). Top 10 research questions related to children physical activity motivation. *Research Quarterly for Exercise and Sport*, *84*, 441–447. Doi: 10.1080/02701367.2013.844030

Chen, S., Sun, H., Zhu, X., & Chen, A. (2014). Relationship between motivation and learning in physical education and after-school physical activity. *Research Quarterly for Exercise and Sport*, *85*, 468-77. Doi: 10.1080/02701367.2014.961054

Chicau Borrego, C., Monteiro, D., Benson, A. J., Miguel, M., Teixeira, E., & Silva, C. (2021). Disentangling the effects of ego and task-involving climate perceptions on cohesion in youth sport. *Sport, Exercise, and Performance Psychology*, *10*, 558–570. Doi: https://doi.org/10.1037/spy0000270

Ciani, K. D., Sheldon, K. M., Hilpert, J. C., & Easter, M. A. (2011). Antecedents and trajectories of achievement goals: A self-determination theory perspective. *British Journal of Educational Psychology*, *81*, 223–243. Doi: https://doi.org/10.1348/000709910X517399

Craig, C. L., et al. (2003). International physical activity questionnaire: 12-country reliability and validity. *Medicine and Science in Sports and Exercise*, *35*, 1381-1395. Doi: 10.1249/01.MSS.0000078924.61453.FB.

Deci, E. L., & Ryan, R. M. (1985). *Intrinsic motivation and self-determination in human behavior.* Springer New York NY, pp. 11-40.

Deci E. L., & Ryan R. M. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, *55*, 68–78. Doi: 10.1037//0003-066x.55.1.68.

Duda, J. L., & Whitehead, J. (1998). *Measurement of Goal Perspectives in the Physical Domain.* Fitness Information Technologies, Morgantown WV, pp. 21-48.

Duda, J. L., & Balaguer, I. (2007). *Coach-created motivational climate*. Human Kinetics, Champaign IL, pp. 117–130.

Edwardson, C. L., et al. (2015). A cluster randomised controlled trial to investigate the effectiveness and cost effectiveness of the 'Girls Active' intervention: a study protocol. *BMC Public Health*, *15*, 526. Doi: 10.1186/s12889-015-1886-z.

Ghazvini, N., Hamar, P. & Soós, I. (2024). Relationship between Intrinsic Motivational Climate of PE lessons and physical activity levels of high school female students in Iran. *Hungarian Review of Sport Science, 25,* 3-13.

Gil-Arias, A., Claver, F., Práxedes, A., Villar, F. D., & Harvey, S. (2020). Autonomy support, motivational climate, enjoyment and perceived competence in physical education: Impact of a hybrid teaching games for understanding/sport education unit. *European Physical Education Review*, *26*, 36-53. Doi: 10.1177/1356336X18816997

Gu, X., Chen, Y., Jacson, A. W., & Zhang, T. (2018). Impact of a pedometer-based goal-setting intervention on children's motivation, motor competence, and physical activity in physical education. *Physical Education and Sport Pedagogy*, *23*, 54-65. Doi: 10.1080/17408989.2017.1341475

Hagger, M. S., & Chatzisarantis, N. L. (2007). *Intrinsic motivation and self-determination in exercise and sport*. Human Kinetics, Champaigne IL.

Isoard-Gautheur, S., Ginoux, C., & Trouilloud, D. (2022). Associations between peer motivational climate and athletes' sport-related well-being: Examining the mediating role of motivation using a multi-level approach. *Journal of Sports Sciences*, *40*, 550-560. Doi: 10.1080/02640414.2021.2004680.

Jakobsen, A. M. (2023). How Can Autonomy Support from a Coach, Basic Psychological Needs, and the Psychological Climate Explain Ego and Task Involvement? *International Journal of Environmental Research and Public Health*, *20*, 6977. Doi: 10.3390/ijerph20216977.

Kokkonen, J., Gråstén, A., Quay, J., & Kokkonen, M. (2020). Contribution of motivational climates and social competence in physical education on overall physical activity: a Self-Determination Theory approach with a creative physical education twist. *International Journal of Environmental Research and Public Health*, *17*, 5885. Doi: 10.3390/ijerph17165885.

Kretschmann, R. (2014). Student motivation in physical education - the evidence in a nutshell. *Acta Kinesiologica*, *8*, 27-32.

Lonsdale, C., Sabiston, C. M., Taylor, I. M., & Ntoumanis, N. (2011). Measuring student motivation for physical education: examining the psychometric properties of the perceived locus of causality questionnaire and the situational motivation scale. *Psychology of Sport and Exercise*, *12*, 284-292. Doi: https://doi.org/10.1016/j.psychsport.2010.11.003

McLaren, C. D., Shanmugaratnam, A., & Bruner, M. W. (2024). Peer-initiated motivational climate, mental health and adherence in competitive youth sport. *International Journal of Sports Science and Coaching*, *19*, 851-856. Doi: https://doi.org/10.1177/17479541231179879

Mouratidou, K., Grassinger, R., Lytrosygouni, E., & Ourda, D. (2022). Teaching Style, Motivational Climate, and Physical Education: An Intervention Program for Enhancing Students' Intention for Physical Activity. *The Physical Educator*, *79*, 514-532. Doi: 10.18666/TPE-2022-V79-I5-11302

Nicholls J. G. (1989). *The competitive ethos and democratic education*. Harvard University Press, Cambridge MA.

Ntoumanis, N. (2001). A self-determination approach to the understanding of motivation in physical education. *British Journal of Educational Psychology*, *71*, 225-242. Doi: 10.1348/000709901158497.

Ommundsen, Y., & Kvalø, S. (2007). Autonomy-mastery, supportive or performance focused? Different teacher behaviours and pupils' outcomes in physical education. *Scandinavian Journal of Educational Research*, *51*, 4. 385–413. Doi: 10.1080/00313830701485551

Pintrich, P. R., & Schunk, D. H. (2002). *Motivation in Education: Theory, Research, and Applications*. Merrill, Columbus OH.

Rodrigues, F., Monteiro, D., Matos, R., Jacinto, M., Antunes, R., & Amaro, N. (2024). Exploring the Dynamics of Athletes' Enjoyment and Self-Determined Motivation, and of the Motivational Climate in Youth Football: A Longitudinal Perspective. *Perceptual and Motor Skills*, *131*, 551-567. Doi: 10.1177/00315125231222152.

Sallis, J. F., McKenzie, T. L., Beets, M. W., Beighle, A., Erwin, H., & Lee, S. (2012). Physical education's role in public health: steps forward and backward over 20 years and HOPE for the future. *Research Quarterly for Exercise and Sport*, *83*, 125-35. Doi: 10.1080/02701367.2012.10599842.

Sherar, L. B., Elisger, D. W., Baxter-Jones, A. D. G., & Tremblay, M. S. (2007). Age and gender differences in youth physical activity: does physical maturity matter? *Medicine and Science in Sports and Exercise*, *39*, 830-835. Doi: 10.1249/mss.0b013e3180335c3c.

Somerset, S., & Hoare, D. J. (2018). Barriers to voluntary participation in sport for children: a systematic review. *BMC Pediatrics*, *18*, 47. Doi: 10.1186/s12887-018-1014-1.

Soini, M., Liukkonen, J., Watt, A., Yli-Piipari, S., & Jaakkola, T. (2014). Factorial validity and internal consistency of the motivational climate in physical education scale. *Journal of Sport Science and Medicine*, *13*, 137-44. PMCID: PMC3918549

Timo, J., Sami, Y. P., Anthony, W., & Jarmo, L. (2016). Perceived physical competence towards physical activity, and motivation and enjoyment in physical education as longitudinal predictors of adolescents' self-reported physical activity. *Journal of Science and Medicine in Sport*, *19*, 750-754. Doi: 10.1016/j.jsams.2015.11.003.

Tidmarsh, G., Kinnafick, F., & Johnston, J. (2020). The role of the motivational climate in female engagement in secondary school physical education: a dual study investigation. *Qualitative Research in Sport*, *14*, 1. 1-16. Doi: 10.1080/2159676X.2020.1862290

Zurita-Ortega, F., Badicu, G., Chacón-Cuberos, R., & Castro-Sánchez, M. (2019). Motivational Climate and Physical Activity: A Multigroup Analysis in Romanian and Spanish University Students. *International Journal of Environmental Research and Public Health*, *16*, 2013. Doi: 10.3390/ijerph16112013.