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The "Motivational Climate in Physical Education Scale" (MCPES) in Greek educational context of elementary school: Psychometric properties

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ABSTRACT

The aim of this study was to confirm the Greek version of "Motivational Climate in Physical Education Scale" (MCPES) in Greek educational context of elementary school. The internal consistency of the scale as well as the gender and the class attendance as factors that differentiate the motivational climate have been, also, examined. In the research participated 187 students, 77 males and 110 females, who were studying 80 in 5th and 107 in 6th grades of elementary schools of Greece. The statistical analysis of the data included: confirmatory factor analysis, reliability and t-test for Independed sample. Data's statistical analysis demonstrated that: a. The hypothesized model produced a significant x^2, normed fit index and comparative fit index. The root mean square error of approximation was also considered to assess the degree of fit of the model. b. Composite reliability and variance extracted of all dimensions of the MCPES demonstrated an acceptable reliability coefficient. c. The gender wasn't a differentiating factor. d. The class attendance was a differentiating factor for the autonomy and ego-involving climate factors with the students of 5th grade scoring higher on both factors. Analysis of the data shows that the MCPES constitutes a reliable instrument to measure the motivational climate during Physical Education in elementary school.

KEYWORDS- Elementary School, Motivational Climate, Physical Education, Students.

1. INTRODUCTION

Education is the base on which will be built and shaped a more active and healthy society [1]. One of the subjects that contributes to the achievement of the above effort is Physical Education (PE), which aims at the all-round development of students. Specifically, through PE, the development of the student is sought on a psychomotor, emotional and cognitive level, in order to develop as an integrated personality [2]. At the same time, in addition to acquiring the necessary knowledge and skills, this lesson also aims to develop positive attitudes that will lead students to an active and healthy way of life [1].

Despite the concerted efforts by the educational community to activate and increase students' physical activity, the modern way of life limits the opportunities for physical development and make children passive and inactive [3]. Researches that have been conducted from time to time with children and adolescents show their physical activity levels to be steadily decreasing [4,5,6,7,8,9]. The main causes of this decline are the absence of free spaces for physical activity and play, the overprotectiveness of the child's wider environment and the increased engagement with new technologies [3,8,10]. Added to the above causes are the restrictions imposed during the Covid-19 pandemic, such as the suspension of schools and mandatory social distancing, resulting in a further decrease in physical activity among children of all ages [11].

However, the new Curriculum of Physical Education in Primary Education, following the new scientific directions and the requirements of modern society, aims to upgrade the lesson and promote lifelong exercise for health and quality of life. In this way, the Teacher of PE assumes a multidimensional role and must follow the guidelines of modern teaching, renew his/her knowledge regarding the design of the learning process, the use of teaching methods and assessment techniques, as well as to create a flexible and encouraging learning environment [1]. Therefore, the creation of an appropriate motivational climate, which offers opportunities for students' active participation in learning and has the ultimate goal of motivating them internally in PE and lifelong exercise, should be a priority for the PE Teachers [12].

The motivational climate based on the social factors from the child's environment, such as teachers, coaches, parents, classmates, who influence the child's psychological orientation and, also, based on the achievement goals they set in specific activities [13]. According to Epstein [14] and Ames [15], six dimensions of the motivational climate are defined and these are Task, Authority, Reward, Grouping, Evaluation and Time, with the initials of the words forming the acronym TARGET. Therefore, the Teacher of PE can influence the personal orientations of the student. Specifically, according to "Achievement Goal Theory" [16,17], when the student's environment is task-oriented, success is defined according to individual effort, while at the same time personal improvement, competence development and learning new skills are encouraged. However, when the environment is ego oriented, success is defined in comparison to the performance of the opponent and a sense of superiority over classmates is encouraged.

According to the above, creating an appropriate climate of motivation is a particularly important issue for PE Teachers and it is necessary for them to be aware of their students' individual learning needs, their preferences, as well as the obstacles that are likely to arise and negatively affect their psychology, resulting in their general discouragement [1]. Therefore, it is necessary to have a reliable instrument to measure the motivation, so that Teachers of PE can be informed of their students' opinions in the form of feedback. In this way, PE Teachers will be able to modify their teaching in a targeted way, achieving the best learning outcomes and a lasting motivational climate of their students for the present and the future. So, the aim of this study was to confirm the Greek version [18] of "Motivational Climate in Physical Education Scale" [19] in Greek educational context of elementary school during the lesson of Physical Education. The internal consistency of the scale has also been examined.

2. MATERIALS AND METHODS

2.1 Sample

The sample of this study consisted of 187 students, 77 males (41.2%) and 110 females (58.8%), who were studying in 5th (80 or 42.8%) and 6th (107 or 57.2%) grade from twelve elementary schools in different geographical areas of Greece (Evros, Serres, Thessaloniki, Ioannina, Imathia, Karditsa, Achaia and Heraklion). The selection of the sample was randomly done.

2.2 Instrument

The Greek version of the MCPES [19] was used. The questionnaire consists of eighteen items researching the four parameters of motivational climate during the PE lesson, which were: Autonomy support, Social relatedness support, Task-involving climate and Ego-involving climate. Specifically, the 1st factor, "Autonomy support", consists of five items and examines the opportunities that PE provides to support students' independence, free choices and the extent to which they can intervene in shaping the lesson (e.g., Students have significant freedom to make choices during PE lessons.). The 2nd factor, "Social relatedness support", consists of four items and explores the development of team spirit, unity and collaboration between the students to resolve difficult situations during the lesson (e.g., Our PE class has a good sense of unity.). The 3rd factor, "Task-involving climate", consists of five items and examines the participant's effort for personal improvement and the perception that mistakes are part of the learning process (e.g., It is important to keep trying even though you make mistakes.). The 4th factor, "Ego-involving climate", consists of four items and investigates the presence of competitive climate in the lessons and the sense of superiority over classmates (e.g., During PE lessons, students compare their performance, mainly with that of others.). This scale uses a Likert-type scale ranging from 1 (totally disagree) to 5 (totally agree).

The translation and amendment of the questionnaire in the Greek language were performed after considering the methodology (back-to-back translation technique) recommended by Banville, Desroriers and Genet-Volet [20].

The survey organizers had to ask for permission from the Ethics Committee of the Democritus University of Thrace and the Minister of Education to conduct the survey at elementary schools. The approval was granted by the university in June 2020 and by the Ministry of Education in January 2021. The study was conducted between February and April 2021. Parental consent was asked to secure students' participation in the research. It was a written permit, and no data revealing the identity of the students for the completion of the questionnaires were required.

2.3 Statistical analysis

The statistical analysis of the data included: a. confirmatory factor analysis to control the questionnaire's validity. The fit indices and their acceptable values are namely minimum discrepancy (x^2), *df*, x^2/df <5, RMSEA<.08, SRMR<.05, CFI>.90, and NFI>.90. b. reliability analysis to control the internal cohesion of the

factors using the indicator composite reliability while the discriminant and convergent validity was considered the indicator average variance extracted. c. t-test for Independed sample to check for possible differences due to gender and class attendance.

3. RESULTS

3.1 Confirmatory factor analysis

From the results which are presented in Table 1 found that the hypothesized model produced a significant x^2 (239.24), and x^2/df (239.24/129) = 1.85, p = .001. The NFI and CFI were found to be .93 and .97, respectively. The RMSEA was also considered to assess the degree of fit of the model. The RMSEA value for the hypothesized model was found to be .061 and SRMR = .05.

Table 1. *Model Fit Indices.*

	N	x^2	df	x^2/df	RMSEA	SRMR	CFI	NFI
Model	187	239.24	129	1.85	.061	.05	.97	.93

3.2 Composite reliability and average variance extracted

All of the dimensions of the "Motivational Climate in Physical Education Scale" demonstrated an acceptable reliability coefficient (≥ .878) and average variance extracted (≥ .591) (Table 2).

Table 2. *Composite reliability and average variance extracted.*

Factor	Factor loading	Composite reliability	Average variance extracted
Autonomy			
Students have a significant role in decision making in PE lessons.	.84		
Students are given the opportunity to affect the way PE lessons are run.	.87	.925	.713
Students have significant freedom to make choices during PE lessons.	.85		
Students are given the opportunity to select activities according to their interests.	.87		
Students can affect the course of PE lessons.	.79		
Social relatedness			
Our PE class has a good sense of unity.	.77		
Our PE class is united when practicing during PE lessons.	.90	.896	.684
Students really "work together" as a team.	.76		
During PE lessons, students "pull together."	.87		
Task involvement			
Students must try their best during PE lessons.	.77		
Learning new things makes me want to learn more.	.74	.878	.591
Progressing every year in our skills is crucial.	.83		
Students must try to improve their skills.	.75		
It is important to keep trying even though you make mistakes.	.75		
Ego involvement			
Students must show that they are better in PE than others.	.83		

During PE lessons, students compare their performance, mainly with that of others.	.88	.940	.797
Students must succeed better than others.	.85		
During PE lessons, students compete with one another in terms of their performance.	.89		
Total variance:		73.20 %	

3.3 *Differences according to gender*

The results presented in Table 3 show that gender didn't differentiate any factor.

Table 3. *Differences according to gender.*

Factor	Total		Boys		Girl		Significance
	M	SD	M	SD	M	SD	
Autonomy	2.79	1.08	2.83	1.14	2.76	1.04	$t_{(185)=}$ .423 p= .673
Social relatedness	3.26	1.03	3.19	1.12	3.31	.95	$t_{(185)=}$ .799 p= .426
Task involvement	3.96	.79	3.96	.89	3.97	.71	$t_{(185)=}$ .097 p= .923
Ego involvement	2.64	1.15	2.64	1.19	2.64	1.12	$t_{(185)=}$ .008 p= .994

3.4 *Differences according to class attendance*

From the results, which are presented in Table 4, it can be seen that the class attendance was a differentiating factor only for the factors "Autonomy" and "Ego involvement". More specifically: a. "Autonomy": The students of 5th grade were more autonomous than the students of 6th grade, b. "Ego involvement": The students of 5th grade were more ego-oriented than the students of 6th grade**.**

Table 4. *Differences according to class attendance.*

Factor	Total		5th grade		6th grade		Significance
	M	SD	M	SD	M	SD	
Autonomy	2.79	1.08	3.11	1.09	2.54	1.00	$t_{(185)=}$ 3.68 p< .000
Social relatedness	3.26	1.03	3.26	1.09	3.25	.98	$t_{(185)=}$ .067 p= .947
Task involvement	3.96	.79	3.92	.81	4.02	.76	$t_{(185)=}$ .785 p= .433
Ego involvement	2.64	1.15	3.06	1.19	2.33	1.01	$t_{(185)=}$ 4.51 p< .000

4. DISCUSSION

Physical Education, apart from the acquisition of knowledge and skills, aims to promote an active and healthy way of life. In order to achieve the above objectives, it is particularly important to create an appropriate motivational climate, which will provide opportunities for active participation of students in the learning process and will aim at their internal motivation in PE and lifelong exercise. Therefore, it is necessary to have a reliable instrument to measure the motivational climate of students, in order for the Teacher of PE to receive feedback from his/her students and to be able to create a lasting motivational climate in PE and exercise with the appropriate techniques. The aim of the present study was to confirm the Greek version [18] of "Motivational Climate in Physical Education Scale" [19] in Greek educational context of elementary school during the lesson of PE.

Regarding the validity of the factors and the structure itself, the MCPES has shown a structure of four oblique factors, coinciding with the findings of Soini et al. [19] and Masadis et al. [18]. As far as reliability is concerned, results have shown the required internal consistency and temporal stability of the scale. The results are similar to the findings of Soini et al. [19] (Cronbach's α autonomy = .85, relatedness = .88, task = .80, and ego = .78), Jaakkola, Wang, Soini and Liukkonen [21] (Cronbach's α autonomy = .85, relatedness = .88, task= .80, and ego= .78) and Masadis et al. [18] (Cronbach's α autonomy = .89, relatedness = .90, task = .89, and ego = .85).

The gender wasn't a differentiation factor of the motivational climate. Therefore, no difference was found between boys and girls on any factor of the scale. The results of the present study agree with the results of the research of Williams and Gill [22] and Tzetzis et al. [8], according to which no relationship was found between gender and achievement goals. It is possible that the lack of differences between boys and girls in terms of

achievement goals is due to the young age of the participants and the fact that they have not yet fully formed their behavior. However, a previous study by Diggelidis and Papaioannou [23] found that boys had higher ego orientation scores than girls, while according to a study by Castro-Sánchez, Zurita-Ortega, Garcia-Marmol and Chacón-Cuberos [24], girls were more social. These different results may be due to the wide age range of participants (10-17 years old) in the Diggelidis and Papaioannou [23] study and the convenience sample of schools exclusively from the city of Granada in the Castro-Sánchez et al. [24] study.

Moreover, according to the results of the present study, the students of 5th grade were more autonomous than the students of 6th grade. It is possible that this may be due to the range of opportunities that Teachers of PE give to 5th students compared to more demanding programming that they make for the students of the last grade of elementary school. Furthermore, another finding of the survey was that the students of 5th grade were more ego-oriented than the students of 6th grade. This fact is interpreted by Damon and Hart [25] and by the theory of social comparison [26]. Specifically, children aged 8-11 years define themselves and their performance in comparison to others, thus increasing their ego orientation. However, at ages 12-15 comparative judgments change to interpersonal inferences, reducing the competitive climate between students.

5. CONCLUSION

According to the results of this research, the following conclusions can be drawn:

1. The Greek version of MCPES is established as a reliable measuring instrument of the climate of motivation in Physical Education of Primary Education in Greece.
2. The gender wasn't a differentiating factor for any factor.
3. The class attendance was a differentiating factor for the autonomy and ego-involving climate factors with the students of 5th grade scoring higher on both factors than the students of 6th grade.

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