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## EVALUATING ACHIEVEMENT MOTIVATION IN PHYSICAL EDUCATION CONTEXT: THE USE OF THE GOAL ORIENTATIONS IN EXERCISE MEASURE

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### *Abstract*

*The study aimed to investigate the validity and reliability of the Goal orientations in exercise measure in the physical education context (GOEM-PE). The sample consisted of 208 Slovene primary and secondary school students ( $M=15.50$ ;  $SD=2.03$ ) who volunteer to participate in the study. The Confirmatory factor analysis (CFA) confirmed two-factor structure of the measure, showing appropriate fit indices ( $\chi^2/df=1.86$ ,  $GFI=0.96$ ,  $CFI=0.97$ ,  $TLI=0.95$ ,  $RMSEA=0.067$ ,  $SRMR=0.042$ ). Cronbach's alpha coefficients were .77 for task orientation and .85 for ego orientation GOEM-PE subscales. In general, the participants were more task- than ego-oriented during their PE lessons. Gender- and age-related differences in goal orientations revealed that males and secondary school students scored higher in ego-oriented goals compared to females and primary school students, while the groups did not differ in task-oriented goals. The results indicated that the GOEM-PE is a valid and reliable assessment tool, suitable for studying motivational processes in school PE settings.*

**Keywords:** motivation; achievement goal theory; goal orientations; physical education; adolescents

### **Introduction**

Regular physical activity and physical education (PE) in schools have several health benefits for children and adolescents (Archer, 2014; Janssen & LeBlanc, 2010), such as improving physical fitness and providing skills that encourage active behaviours throughout life (Erflle & Gamble, 2015). PE not only promotes motor development and the maintenance of favorable body weight, but also positively impacts students' learning outcomes, improves their social skills, self-confidence, and psychological well-being (Ardoy et al., 2014; Smith, 2020; Sullivan, Kuzel, Vaandering, & Chen, 2017). In order to gain all the above-mentioned benefits, it is important to implement well-designed and effective PE programmes and take into account psychological factors that influence students'

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motivation, enthusiasm for learning new skills, and satisfaction in PE classes (Moreno-Murcia, Zomeño, Marín, Ruiz, & Cervelló, 2013; Sierra-Díaz, González-Víllora, Pastor-Vicedo, & López-Sánchez, 2019).

Motivation plays a crucial role in sport and PE, as it permits a better understanding of why and how individuals initiate, regulate, and sustain their behaviour (Clancy, Herring, & Campbell, 2017). The most commonly used contemporary theoretical perspectives explaining motivational processes in physical activity settings are the Self-determination theory (Deci & Ryan, 2000; Ryan & Deci, 2007) and the Achievement goal theory (Nicholls, 1989).

Specifically, the Achievement goal theory (AGT) assumes that the greatest point of interest for individuals in achievement contexts such as PE lies in demonstrating competence and ability. According to Nicholls (1989, 1992), two different achievement goals, namely task and ego involvement drive competence perception. Therefore, two goal orientations can be differentiated: ego (or performance) orientation and task (or mastery) orientation. A person can be more task-oriented, defining success in exercise based on self-referenced criteria (*e.g.*, increasing effort) or can be predominantly ego-oriented, defining success as achievable through personal ability and deception (Granero-Gallegos et al., 2017). Task-oriented individuals are mostly focused on mastering a particular task and improving their skills (Lee, Whitehead, Ntoumanis, & Hatzigeorgiadis, 2008), and show a high degree of interest and effort in a particular activity (Sideridis & Kaplan, 2011). Moreover, they tend to consider failure as a learning experience to improve their skills, rather than a negative or frustrating experience (Granero-Gallegos et al., 2017). On the other hand, individuals who are highly ego-oriented judge their competence by comparing themselves to others (Petherick & Markland, 2008) and consider sport practice as a way to gain recognition and social status (Cetinkalp & Turksoy, 2011). Furthermore, they mostly apply normative criteria for defining success or failure in sport, focusing primarily on performance and the result of competition, and perceive failure as an indicator of their limited abilities (Roberts, Treasure, Darren, & Conroy, 2007).

Duda (2001) emphasizes that these two goal orientations are not opposed to each other on the same continuum but rather can be considered as orthogonal dimensions since a person can be either high or low on both dimensions, high on task and low on ego orientation, or vice versa. According to Gimeno and Garcia-Mas (2010), those who score high on both task and ego orientation tend to have high levels of general motivation, while those who score low on both dimensions tend to have the lowest general motivation be high or low in either or both. Some authors found out that ego-orientation level was higher in the competition context than in the training one because of the psychological pressure (van de Pol & Kavussanu, 2012).

Past studies in the field of motivation in PE using the TEOSQ questionnaire have shown that high task orientation was positively correlated with intrinsic motivation (Barić, Vlašić, & Erpič, 2014) and enjoyable experiences of students during PE classes (Gråstén, Jaakkola, Liukkonen, Watt, & Yli-Piipari,

2012). On the contrary, greater ego orientation and low task-oriented goals were associated with boredom and lower levels of enjoyment in PE (Ruiz-Juan, Piéron, & Zamarripa, 2011). Considering that intrinsic motivation and satisfaction with PE can be a significant predictor of sports participation and persistence outside the school (Ntoumanis, 2005), there is a need for appropriate measurement tools assessing achievement goal orientations of students attending regular PE classes.

To assess individual differences in goal orientations from AGT perspective various instruments have been developed, such as the Task and Ego Orientation in Sport Questionnaire (TEOSQ; Duda & Nicholls, 1992), and the Perceptions of Success Questionnaire (PSQ; Roberts, Treasure & Belague, 1998). The TEOSQ is the most extensively employed measure for assessing goal orientations that has shown good factorial validity (supporting the two-factor structure) and reliability in different samples, including various sports, competitive levels, and nationalities. Despite the appropriate psychometric characteristics of the TEOSQ and the PSQ, it should be noted that both instruments were designed to measure goal orientations mainly in competitive sports (Lochbaum et al., 2016). Consequently, Petherick and Markland (2008) have developed the Goal Orientations in Exercise Measure (GOEM), which is applicable also for recreation and health-related exercise contexts. Confirmatory factor analysis revealed a two-factor structure (ego and task orientation) of the GOEM, with measurement invariance across gender and different exercise groups. The GOEM was also associated with different forms of motivation based on self-determination theory, measures of perceived ability, and perceived threat in physical activity. Task orientation was regarded as being positively related to intrinsic motivation, identified regulation, and perceived ability, whereas ego orientation was positively related to introjected and external motivational regulations, and perceived threat (Petherick & Markland, 2008). Recent studies have confirmed the factor structure of the GOEM in samples of Turkish (Ersöz, Müftüler, Lapa, & Tümer, 2017), Portuguese (Cid et al., 2021), and Polish adult exercisers (Tomczak, Kleka, Walczak, Bojkowski, & Walczak, 2021). Although the GOEM has been used to assess goal orientations in different exercise settings, the instrument has not been applied to students regularly attending PE classes. Given that PE plays a key role in promoting healthy habits by raising awareness of the importance of regular physical activity (Aibar, Abós, García-González, González-Cutre, & Sevil-Serrano, 2021), it seems necessary to explore students' motivation, along with goal orientations in PE classes.

## **Objectives**

Taking into account the need for valid and reliable instruments for measuring motivation in the field of PE, the first objective of this study was to investigate the factorial validity and the reliability of the GOEM, adapted for use in the PE context (hereafter abbreviated as GOEM-PE). The second objective was to test the convergent and discriminant validity of the measure. For this purpose, relationships between GOEM-PE subscales and different forms of motivation assessed by the BREQ-2 questionnaire (Markland & Tobin, 2004) were

investigated. We assumed that task-oriented goals in PE would be positively related to more autonomous forms of motivation (*i.e.*, intrinsic motivation) and negatively related to more controlled forms of motivation (*i.e.*, extrinsic regulation and amotivation), while we expected the opposite direction of association for ego orientation (Petherick & Markland, 2008; Tomczak et al., 2021). Finally, age- and gender-related differences in goal orientations were examined among participants.

## Methods

### *Participants*

The sample consisted of 208 male and female students aged between 13 and 19 years ( $M=15.50$ ,  $SD=2.03$ ). Participants were recruited from different primary and secondary schools in the Coastal-Karst region of Slovenia. Sample demographic characteristics are presented in Table 1.

Table 1. Demographic characteristics of the sample

Age	n (%)	Gender	n (%)	School level	n (%)
13	35 (16.8)	Female	111 (53.4)	Primary school	101 (48.6)
14	38 (18.3)	Male	97 (46.6)	Secondary school	107 (51.4)
15	39 (18.5)				
16	26 (12.6)				
17	29 (13.9)				
18	25 (12.1)				
19	16 (7.7)				

### *Instruments*

*Goal Orientations in Exercise Measure* (GOEM; Petherick & Markland, 2008) is a 10-item inventory that assesses individual differences in the ways that people construe their perception of success related to physical activity. Two major goal perspectives are evaluated: task orientation and ego orientation. The responses are scored on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Higher scores in each dimension are indicative of greater orientation toward task and ego goals. Internal consistency coefficients of the original instrument were .78 and .88 for the task and ego subscales, respectively (Petherick & Markland, 2008). For the purpose of the study, the existing Slovenian translation of the scale (Dolenc, 2015) was adapted for the use in PE context - GOEM-PE (task orientation item: *e.g.*, »In my PE classes I exercise to the best of my ability«; ego orientation item: *e.g.*, »I can show my classmates that I am better than everyone else«).

*The Behavioral Regulation in Exercise Questionnaire* (BREQ-2; Markland & Tobin, 2004; Moreno, Cervelló, & Martínez, 2007) was used to measure students' underlying motivational regulation relating to physical activity participation. The BREQ-2 contains 19 items and measures five different types of motivation: intrinsic motivation (*e.g.*, »I exercise because it is fun«), identified regulation (*e.g.*, »I value the benefits of physical activity«), introjected regulation

(*e.g.*, »I feel guilty when I exercise«), external regulation (*e.g.*, »I exercise because other people say I should«), and amotivation (*e.g.*, »I don't see why I should have to exercise«). Participants respond using a 5-point Likert scale ranging from 0 (not true for me) to 4 (very true for me). Confirmatory factor analytic procedures revealed that the overall model fit was appropriate ( $\chi^2/df=1.09$ , CFI=0.95, RMSEA=0.02, SRMR=0.05) with Cronbach alphas ranging from .73 to .86 (Markland & Tobin, 2004). The Slovenian version of the BREQ-2 (Smole, 2016) showed adequate internal consistency with Cronbach alphas ranging between .73 and .79.

#### *Procedure*

Permission to conduct the study was secured from school officials. Before the administration of the instruments, informed consent was obtained from the students and their parents/guardians. All participants were informed about the purpose of the study, the anonymity and confidentiality of their data, and the voluntary nature of their participation. All participants provided consent by accepting to answer the questionnaire. The completion of the scales was carried out in small groups before PE classes and took approximately ten minutes.

#### *Statistical analysis*

To assess the factor structure of the GOEM-PE confirmatory factor analysis (CFA) was performed using IBM SPSS Amos 27. Assumptions to conduct CFA were checked including univariate and multivariate normality and sufficient sample size. A preliminary analysis was conducted to verify whether the data follow a normal distribution. The current sample size was above the 10:1 ratio (ten participants for each parameter to be estimated), therefore suitable for CFA (Kline, 2016). Several fit indices were considered to examine the adequacy of the GOEM-PE model (Byrne, 2016; Kline, 2016): Chi-square by degrees of freedom ratio ( $\chi^2/df$ ), Goodness of Fit (GFI), Comparative fit index (CFI), Tucker-Lewis index (TLI), Root Mean Square Error of Approximation (RMSEA) and Standardized Root Mean Square Residual (SRMR). The following cut-off values were used to confirm good fit of the model:  $\chi^2/df < 3$ , RMSEA < 0.08, SRMR < 0.08, GFI > 0.90, CFI > 0.90, and TLI > 0.90. Descriptive statistics and inferential statistics were performed using IBM SPSS Statistics 27. The internal consistency reliability of the GOEM-PE was measured by using standardized Cronbach's alpha coefficient, inter-item correlations, and corrected item-total correlations. Convergent and discriminant validity of the GOEM-PE was determined by calculating Pearson's correlations between GOEM-PE and BREQ-2 subscales. An independent-samples t-test was conducted to examine differences in goal orientations regarding gender and age/school level. Effect sizes were expressed as Cohen's d. Cohen's d effect sizes are generally defined as small:  $d = .20$ , medium:  $d = .50$ , and large:  $d = .80$  (Cohen, 2009).

## Results

### *Descriptive statistics and reliability of the GOEM-PE*

Preliminary analysis revealed no missing values, and no univariate outliers were detected. The mean for all the items in the GOEM-PE scale ranged from 2.26 (SD=1.15) to 4.58 (SD=.72). Results showed that skewness and kurtosis values were within the range  $-1/+1$  indicating a normal distribution of the data (Leech, Barrett, & Morgan, 2015). Task-orientation subscale presented a higher mean compared to ego-orientation subscale (Table 2).

Table 2. Descriptive statistics of the GOEM-PE subscales

GOEM-PE	No. of items	M	SD	Skewness	Kurtosis
Task orientation	5	4.10	.82	-.63	.55
Ego orientation	5	2.93	1.03	.12	-.48

Table 3 shows the reliability analysis for the GOEM-PE. The corrected item-total correlation values were all positive ranging from .48 to .75. The standardized Cronbach's alpha coefficients were .77 and .85 for task and ego orientation subscales, respectively, and the coefficients did not increase if any of the items were deleted. Hence, the reliability values indicated an acceptable internal consistency in the GOEM-PE subscales.

Table 3. Reliability analysis of the GOEM-PE

GOEM-PE subscale	Cronbach's alpha	Item	Corrected item-total correlation	Cronbach's alpha if item deleted
Task orientation	.76	GOEM1	.48	.75
		GOEM3	.64	.72
		GOEM4	.46	.74
		GOEM6	.61	.70
		GOEM9	.53	.71
Ego orientation	.85	GOEM2	.52	.85
		GOEM5	.69	.81
		GOEM7	.65	.82
		GOEM8	.75	.79
		GOEM10	.70	.81

### *Factorial validity of the GOEM-PE*

To examine the goodness of fit of the two-factor solution of the GOEM-PE, CFA with maximum likelihood estimation was used. The overall fit of the model to the data was reasonably good based on commonly recommended cut-off values for evaluating model adequacy:  $\chi^2/df=1.86$ , GFI=0.96, CFI=0.97, TLI=0.95, RMSEA=0.06, SRMR=0.04. The CFA parameter estimates are presented in Table 4. All factor loadings were significant, ranging between .55 and .84 ( $M_\lambda=.70$ ), Item standardized factor loadings were, whereas the correlation between task- and ego orientation subscales was .24 ( $p=.031$ ). Squared multiple correlation coefficients ( $R^2$ ), describing the proportion of factor variance explained by observed variables ranged from .32 to .70.

Table 4. Results of confirmatory factor analysis of the GOEM-PE: parameter estimates

GOEM-PE item	Factor loadings ( $\lambda$ )	R <sup>2</sup>
<i>Task orientation</i>		
GOEM1	.55	.32
GOEM3	.76	.58
GOEM4	.59	.37
GOEM6	.73	.53
GOEM9	.63	.41
<i>Ego orientation</i>		
GOEM2	.56	.34
GOEM5	.75	.57
GOEM7	.71	.52
GOEM8	.84	.70
GOEM10	.78	.61

*Convergent and discriminant validity of the GOEM-PE*

Convergent and discriminant validity was verified through identification of the mutual correlations between the subscales of the GOEM-PE with motivational regulations measured by the BREQ-2 (Table 5). Task orientation was positively correlated with intrinsic motivation and identified regulation ( $p < .01$ ), whereas negatively correlated with amotivation ( $p < .01$ ). Ego orientation was positively correlated with introjected regulation ( $p < .01$ ), external regulation, and amotivation ( $p < .05$ ). All significant correlations were weak to moderate.

Table 5. Correlations between GOEM-PE and BREQ-2 subscales

	Task orientation	Ego orientation
Intrinsic motivation	.39**	-.10
Identified regulation	.29**	-.05
Introjected regulation	.12	.32**
External regulation	-.10	.19*
Amotivation	-.29**	.17*

Notes: \* $p < .05$ ; \*\* $p < .01$

*Gender and school-level differences in goal orientations during physical education among students*

Independent samples t-test was conducted to determine gender and school-level differences in the GOEM-PE subscales (Table 6). Male students scored higher in the ego orientation subscale compared to female students ( $t = 2.03$ ,  $df = 206$ ,  $p = .047$ ). Also, secondary school students showed higher mean values in ego orientation subscale than primary school students ( $t = -4.17$ ,  $df = 206$ ,  $p < .001$ ). In both cases, the effect size was medium to large. There were no differences in task orientation subscale according to gender and school level.

Table 6. Differences in goal orientations in PE according to gender and school level

		n	M	SD	t	Cohen's d
Task orientation	Males	97	4.08	.65	-1.08	-.16
	Females	111	4.18	.60		
	Primary school	101	4.07	.70	-0.60	-.08
	Secondary school	107	4.12	.59		
Ego orientation	Males	97	3.26	.96	2.03*	.56
	Females	111	2.72	.98		
	Primary school	101	2.62	.95	-4.17**	-.61
	Secondary school	107	3.18	.92		

Notes: \* $p < .05$ ; \*\* $p < .001$

## Discussion

Concerning the main objective of this study, the CFA results provided support to the two-factor model of the GOEM-PE, namely task orientation (*i.e.* based on personal improvement during PE classes) and ego orientation (*i.e.* based on comparing own performance with others) among the sample of Slovenian students attending school PE. Additionally, the standardized factor loadings for each set of items were all fairly high. The two-dimensional structure of the GOEM-PE was consistent with AGT (Nicholls, 1992) and the factor structure of the GOEM identified in previous studies (Cid et al., 2021; Ersöz et al., 2017; Petherick & Markland, 2008; Tomczak et al., 2021). Results also revealed adequate internal consistency for both GOEM-PE subscales since the composite reliability coefficients were above .70 (Hair, 2014). Convergent and discriminant validity of the measure was also examined through correlational analyses between the GOEM-PE subscales and constructs of behavioral regulations assessed by the BREQ-2 questionnaire. Task orientation was positively related to intrinsic motivation and identified regulation, and negatively to amotivation, while ego orientation was positively related to forms of extrinsic motivation (introjected regulation and external regulation) and amotivation. These results are consistent with past literature (Cid et al., 2021; Ersöz et al., 2017; Petherick & Markland, 2008). It seems that when students are focused on learning new skills and thrive for increasing their physical fitness, they are likely to present a more autonomous motivation; on the contrary, if they understand success in PE primarily as competing and overcoming others, they show more controlled forms of motivation.

Participants in our study showed greater levels of task orientation than ego orientation, which indicates that their success in PE is more often defined through personal improvement and effort than through winning and beating others. These findings are comparable with previous studies that used instruments other than GOEM (Barić et al., 2014; Gómez-López et al., 2015). Given that the function of PE is primarily learning and development of motor skills, a predominantly task-oriented goal perspective is associated with a more preferable pattern of determining goals in school PE and youth sports. Namely, research in youth sport has shown that task orientation rather than ego orientation fosters intrinsic



motivation which is consequently associated with enjoyment and satisfaction along with a greater commitment to sports participation (Granero-Gallegos, Baena-Extremera, Gómez-López, & Abrales, 2014; McCarthy, Jones, & Clark-Carter, 2008).

The results of our study showed that boys scored higher in ego orientation compared to girls whereas there were no gender differences in task orientation. These findings were congruent with other studies indicating that male students tend to be more ego-oriented than female students (Alić, 2018; Gómez-López et al., 2015). However, less consistent findings were found in determining gender differences in task orientation goals. Some studies reported higher values in task orientation in girls (Barić et al., 2014), while others reported no gender differences (Alić, 2018). The higher ego orientation of male students can be attributed to their natural inclinations toward competitiveness provided by the sports environment. Competitiveness is believed to be an important motivational factor since generates excitement and is therefore stimulating for a large number of students (Alić, 2018). According to Kondric and colleagues (2013) males are more prone to use sports environment and competition to gain popularity among peers and demonstrate their superiority over competitors, which is in line with traditional male stereotypes and gender roles.

In terms of age, secondary school students were more ego-oriented than primary school students but both groups were similar concerning task-oriented goals. The results are partially consistent with previous research among PE students aged between 12 and 18 within PE classes. In the study conducted by Barić et al. (2014) older pupils were both more task- and more ego-oriented than the younger ones, while other authors (Gómez-López et al., 2015; Nicolosi, Ortega Ruiz, & Benítez Sillero, 2021) found out that younger students scored higher in task orientation compared to older students, but they did not differ in ego orientation. Higher ego orientation in secondary school students can be explained by the fact that older students participate in sports at higher levels; sport becomes increasingly competitive and highly selective, which means a greater focus on results and winning. This modification of goals can also be reflected in the motivation of students in PE.

### **Conclusions**

Given the several benefits of physical activity for children and adolescents (Archer, 2014; Smith, 2020; Sullivan et al., 2017), it is important to examine different motivational processes in physical education, including goal orientations. The current study aimed to investigate the psychometric characteristics of the Goal orientations in exercise measure in the physical education context - GOEM-PE. The study findings suggest that the Slovenian version of the GOEM-PE has satisfactory psychometric indices in both the aspect of validity and reliability, and seems to present a suitable instrument for task and ego orientations in PE classes.

However, some methodological limitations of the present study should be noted. First, convenience sampling was used in the study, including students from a limited geographic area. Future research should replicate this study with a larger sample size recruited from a wider geographical region and with randomly selected participants. Further, this was the first attempt to validate the GOEM-PE into the Slovenian context. Therefore, generalisations to other cultures must be made with caution, as more research is needed to establish cross-cultural validity of the instrument.

The results of the research suggest important practical implications, as they provide insight into students' motivation during involvement in PE and school sport programmes. Individual goal orientations may be influenced or modulated by the perceived motivational climate during PE (Curran et al., 2015). Thus, PE teachers play a crucial role in creating an involving mastery motivational climate and adopting appropriate teaching methods to guide students to acquire and improve their motor skills and not only to achieve good results. Moreover, findings from a recent study (Kalajas-Tilga, Koka, Hein, Tilga, & Raudsepp, 2020) indicate that to enhance adolescents' daily moderate-to-vigorous physical activity, and thus provide the recommended amount of physical activity, special focus should be put on increasing their intrinsic motivation in PE. This suggests that students should be encouraged toward setting mainly task-oriented goals which are more closely related to intrinsic motivation and satisfaction during PE practice.

#### *Ethics statement*

The study was carried out in accordance with the recommendations of Code of Ethics of University of Primorska. The procedures used in this study adhere to the tenets of the Declaration of Helsinki and its later amendments. Written informed consent was obtained from all participants in the study.

#### *Conflicts of interest*

The author declare no conflict of interest.

#### *Author contribution*

The author (P.D.) designed the study, conducted the statistical analyses, and wrote the manuscript.

#### *Funding*

This research received no external funding.

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Received March 1, 2022  
Revision March 27, 2022  
Accepted April 8, 2022