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# THE SITUATIONAL MOTIVATION SCALE (SMS-15) FOR CHILDREN: DESIGN AND PRELIMINARY PSYCHOMETRIC PROPERTIES ASSESSMENT

## SKALA MOTYWACJI SYTUACYJNEJ SMS-15 DLA DZIECI: KONSTRUKCJA I WSTĘPNA OCENA WŁAŚCIWOŚCI PSYCHOMETRYCZNYCH

**Keywords:**  
motivation in  
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ational Motivation  
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Theory, measurement  
of motivation

**Summary:** The aim of the article is to present the design and carry out a preliminary assessment of the psychometric properties of the Situational Motivation Scale SMS-15 for children based on Deci and Ryan's Self-determination Theory. Three hundred children aged 11–15 (178 girls and 122 boys) took part in the validation study. The SMS-15 scale has satisfactory theoretical accuracy, internal consistency and reliability. Cronbach's  $\alpha$  coefficient equals .84 for the subscales of introjected motivation and regulation by identification; whereas for the subscales of intrinsic motivation, external regulation and amotivation it equals .82.

**Słowa kluczowe:**  
motywacja u dzieci,  
Skala Motywacji  
Sytuacyjnej, SMS-15,  
teoria autodetermina-  
cji, pomiar motywacji

**Streszczenie:** Celem artykułu jest przedstawienie konstrukcji oraz wstępna ocena właściwości psychometrycznych Skali Motywacji Sytuacyjnej SMS-15 dla dzieci w oparciu o teorię autodeterminacji Deciego i Ryana. W badaniu walidacyjnym wzięło udział 300 dzieci w wieku 11–15 lat (178 dziewczyn i 122 chłopaków). Skala SMS-15 ma zadowalającą trafność teoretyczną, spójność wewnętrzną oraz rzetelność. Współczynnik  $\alpha$  Cronbacha wynosi .84 dla podskali: motywacji introjektowanej oraz regulacji przez identyfikację, a także .82 dla podskali: motywacji wewnętrznej, regulacji zewnętrznej i amotywacji.

## Introduction

Motivation is a theoretical construct that explains the behavior of individuals, their direction and duration (Brophy, 2002). The psychodynamic theory of motivation assumes that all activity is determined, and its source is mental energy. What motivates human behavior are drives (Lichtenberg, Lachmann & Fosshage, 2016). In terms of behavioral psychology, motivation is associated with positive reinforcement (rewards) and negative reinforcement (punishments). Behavioral patterns are instrumental in nature, and reinforcements constitute the basic tools employed to change them (Koziellecki, 1998). In the cognitive approach, motivation results from learning characteristics and the individual construction of the world in which cognitive needs, such as development needs, play a key role (Janeiro, 2010). In the analysis of various motivational constructs, attention should be paid to the theory of self-determination (SDT) as presented by Deci and Ryan (1975).

The theory of self-determination is a contemporary concept of human activity in the mainstream of humanistic psychology. The approach takes into account the key role of motivational processes in the functioning of individuals. Deci and Ryan (1975, 2000) distinguish three basic (universal) needs in human life: autonomy, competence and social relations. The first concerns the sense of causality and the perception of activity as intrinsic to personal desires. It is connected with the possibility of choice and does not exclude dependence on other people. The second refers to one's own effectiveness in their environment as well as to the purpose of behavior exhibited by them. Thanks to the need for competence, an individual is willing to learn and is

open to new experiences. The last one is a sense of attachment and care expressed by others. The consequence of the need for social relations is building and maintaining interpersonal contacts as well as a willingness to help others. Fulfilling these main needs has a positive impact on life satisfaction and a gives one a sense of well-being, whereas the lack of possibility to satisfy them leads to negative emotions, passivity or social isolation (Ryan, Huta & Deci, 2008; Huta & Ryan, 2010; Lekes et al., 2010). Human activity is undertaken on a voluntary basis to satisfy needs and pleasures.

Deci and Ryan (1975; 2000) distinguished three statuses of motivation: intrinsic motivation, extrinsic motivation and amotivation. The first one allows us to explain the spontaneous interests of individuals, the exploration of new issues and the need to achieve mastery in action (Mageau et al., 2009). Activity determined by intrinsic motivation is considered to be self-determined, immanent and triggered by emotions. Extrinsic motivation is an opposite type to intrinsic motivation. It plays an instrumental role and takes into account the consequences of actions. Adequate extrinsic motivation creates a continuum of internally and externally regulated states of varying intensity: external regulation, introjected regulation, regulation by identification and integrated regulation (Deci & Ryan, 2008). The term amotivation describes the state of non-autonomous activity with no regulation. It is associated with a sense of incompetence and a lack of situational control. In the literature on the subject, it is often compared to the concept of learned helplessness by Seligman (Vallerand & Ratelle, 2002; Deci & Vansteenkiste, 2004).

Accordingly, the above-mentioned authors identified four regulatory styles that influence the level of self-determination and relate to the concept of internalization (Deci & Ryan, 2000). Internalization assumes that the recognition of activity that complies with social norms as one's own takes place under the influence of external motivators. The first style is *external regulation*, which stems from the desire to obtain a reward or to avoid punishment. The activity is undertaken independently, but only under the pressure of external stimuli. The second style is *introjected regulation*, which also initiates behavior because of possible rewards or sanctions. In this case, however, there is an internal localization of pressure and the activity is undertaken to feel proud, avoid guilt or reduce anxiety. *Identified regulation* consists in self-acceptance of behavior and the attribution of personal meaning to it. Such activity is considered to be more autonomous than behavior under the influence of internal pressures but is still identified as a means to an end rather than a goal. Integrated regulation

is similar to intrinsic motivation. In this case, activity is undertaken in accordance with one's own values and a coherent sense of self. Behavior is fully tailored to the individual's goals.

The theory of self-determination makes it possible to unify thinking about human activity based on engagement (Meyer & Gagne, 2008).

### Measurement of motivation in children

The literature on the subject provides several tools for measuring motivation in children and youth, including the *Ja i moja szkoła* [Me and My School] questionnaire (Zwierzyńska & Matuszewski, 2002), *Kwestionariusz Motywacji Szkolnej Gimnazjalisty* [The School Motivation Questionnaire for Junior High School Students] (Sterczyński et al., 2010) and *Kwestionariusz motywacji do nauki* [The Motivation for Learning Questionnaire] (Gózdź, 2015). All available questionnaires focus exclusively on the child's educational motivation. There is no tool to measure motivation in non-school settings, for example, during sports or therapeutic activities. Therefore, it was decided to construct a short and universal Situational Motivation Scale SMS-15 for children based on the Self-determination Theory (SDT) according to Deci and Ryan (1975). The questionnaire concerns: intrinsic motivation, external regulation, regulation by identification, introjected regulation and amotivation. Integrated regulation was not included in the questionnaire because of its similarity and strong links to internal motivation.

### Methodological assumptions of own research

**Research objective.** The aim of own research was to design a Situational Motivation Scale (SMS-15) for children and carry out a preliminary assessment of its psychometric values.

**Materials and methods.** The research was conducted in the spring of 2019. Participation was anonymous and voluntary. The experimental study (Test A) involved 70 children from primary schools in Kraków aged 11–15 ( $M = 13.27$ ,  $SD = 1.34$ ). Sixty percent (60%) of the participants were girls ( $N = 45$ ) and 40% of the participants were boys ( $N = 25$ ). The validation study (Test B) involved 300 primary school children from Kraków, Warsaw and Sosnowiec aged 11–15 ( $M = 14.10$ ,  $SD = 1.23$ ). Of these participants, 59% were girls ( $N = 178$ ) and 41% were boys ( $N = 122$ ).

Apart from the SMS-15, the tool's validity was assessed using *Kwestionariusz motywacji do nauki* [The Motivation for Learning Questionnaire] (Gózdź, 2015) in the form of a self-description. The tool consists of 30 items arranged in five scales: external motivation (Cronbach's  $\alpha = .75$ ), introjected motivation ( $\alpha = .88$ ), identification-based motivation ( $\alpha = .96$ ), intrinsic motivation ( $\alpha = .93$ ) and amotivation ( $\alpha = .89$ ). The examined person expresses his/her attitude on the five-point Likert scale, where 1 is the answer "I completely disagree" and 5 – "I completely agree."

**Statistical analyses applied.** Data analysis was performed using the program SPSS version 25 and Amos version 25. The normality of distribution was assessed by means of the Kolmogorov-Smirnov test. To verify the homogeneity of variance, the Levene test was applied. The obtained results allowed for the application of parametric tests. To determine the significance of differences, the Student's t-test, one-way ANOVA variance analysis and MANOVA analysis (multivariate ANOVA) were used. In order to determine the relationships between the variables, the r-Pearson correlation coefficient was applied. In order to reduce the dimensions, exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) were applied.

## Own research results

**Study 1.** The experimental version of the SMS-15 scale included 25 items (5 for each dimension). The experimental version was tested on 70 children (Test A). As a result of the analyses, three items with the strongest discriminating power for each of the measured aspects (15 items in total) were distinguished. All items which were included in a given dimension correlated with its overall result at a level above .50. The final version of the SMS-15 scale was subjected to further validation works.

**Study 2.** The final version of the SMS-15 scale was tested on 300 children (Test B). Motivation was measured on the basis of different activities, i.e., mathematics (N = 100), participation in sports activities (N = 100) and participation in theatre activities (N = 100). The average total results are presented in Table 1.

Table 1  
Average results on the SMS-15 scale (N=300)

SMS-15	Min	Max	M	SD
MWE	3	20	16.00	4.29
RZE	3	21	11.84	5.17
IDE	3	21	17.83	4.06
INR	3	21	13.73	5.03
AMO	3	21	9.49	4.65

MWE – intrinsic motivation, RZE – external regulation, IDE – regulation by identification, INR – introjected regulation, AMO – amotivation, M – mean, SD – standard deviation

Source: designed by the Author.

The MANOVA analysis of variance showed multidimensional differences in the level of motivation among mathematics students, young athletes and participants of theatre classes,  $F(10.586) = 8.81$ ;  $p < .001$ ;  $\eta^2 = .13$  (based on the Lambda Wilks test). Homogeneous F-tests showed significant differences in the activity of the dependent variables: intrinsic motivation,  $F(2.297) = 20.62$ ;  $p < .001$ ,  $\eta^2 = .12$ , external regulation,  $F(2.297) = 15.43$ ;  $p < .001$ ,  $\eta^2 = .09$ , regulation by identification,  $F(2.297) = 9.73$ ;  $p < .001$ ,  $\eta^2 = .06$  and amotivation,  $F(2.297) = 35.45$ ;  $p < .001$ ,  $\eta^2 = .19$ . Differences in the scope of introjected regulation proved to be statistically insignificant. *Post hoc* comparisons using Tukey's test method were used to assess the differences. Young athletes ( $M = 17.38$ ,  $SD = 3.15$ ) and theatre class participants ( $M = 16.70$ ,  $SD = 3.22$ ) achieved significantly higher results in terms of intrinsic motivation than mathematics students ( $M = 13.71$ ,  $SD = 5.35$ ). Young sportsmen ( $M = 9.84$ ,  $SD = 4.45$ ) achieved significantly lower results in terms of external regulation than the other groups, i.e., participants of theatre classes ( $M = 11.97$ ,  $SD = 5.30$ ) and mathematics students ( $M = 13.71$ ,  $SD = 5.02$ ). The differences between the last two groups proved to be statistically significant. Young athletes ( $M = 18.22$ ,  $SD = 3.49$ ) and theatre class participants ( $M = 18.82$ ,  $SD = 2.60$ ) scored significantly higher in terms of regulation by identification than mathematics students ( $M = 16.45$ ,  $SD = 5.28$ ). Young athletes ( $M = 7.45$ ,  $SD = 3.27$ ) and theatre students ( $M = 8.74$ ,  $SD = 4.35$ ) declared a significantly lower level of amotivation than mathematics students ( $M = 12.27$ ,  $SD = 4.80$ ).

In this study, age and sex did not differentiate the results in a statistically significant way.

## Validity

The SMS-15 scale was evaluated by competent judges (9 psychologists) in order to verify the validity of the content according to Lawshe's method (1975). The CVR (content validity ratio) for each item exceeded the required value of .75.

In order to assess the theoretical validity, exploratory factor analysis using the main axes with Oblimin diagonal rotation and Kaiser normalization was applied. The obtained results suggested a 5-factor model, which explained 68.5% of the variance in total. Table 2 shows the factor loadings for each dimension of the SMS-15 scale after rotation. All the loadings obtained a value greater than or equal to .50.

Table 2  
*Factor loadings for individual items of the SMS-15 scale after rotation (N = 300)*

Items	Factor				
	I	II	III	IV	V
1.				.73	
2.			.78		
3.				.68	
4.		.50			
5.					.62
6.	.75				
7.		.82			
8.			.76		
9.					.81
10.			.71		
11.	.81				
12.				.55	
13.		.79			

Items	Factor				
	I	II	III	IV	V
14.	.80				
15.					.51
Eigenvalue	2.25	2.20	2.17	1.94	1.72
Explained variance	15.01%	14.64%	14.47%	12.3%	11.45%
Cronbach's $\alpha$	.84	.84	.82	.82	.82

Source: designed by the Author.

The 5-factor model (Fig. 1) was also verified by means of confirmatory factor analysis with estimation by the method of generalized least squares. All the relationships between the factorial results and the assessments of individual items obtained a value greater than .70. The adjustment was based on:  $X^2/df$  indicator, GFI (goodness of fit index), AGFI (adjusted GFI), RMSEA (root mean square error of approximation), TLI (Tucker-Lewis index), CFI (confirmatory fit index). In the case of  $X^2/df$  indicator, a value less than or equal to 2 was required. In the case of GFI, AGFI, TLI, CFI, CFI, a value greater than or equal to .90 was required. In the case of RMSEA, a value less than or equal to .05 was required (Schreiber et al., 2006; Byrne, 2010; Bedyńska & Książek, 2012). The 5-factor model met all the criteria for data adjustment. The values of goodness of fit index are presented in Table 3.

Table 3

*Adjustment indicators for 5-factor SMS-15 scale model in CFA (N = 300)*

$X^2$	df	p	$X^2/df$	GFI	AGFI	RMSEA	TLI	CFI
138.84	89	.14 (ni)	1,56	.97	.94	.05	.93	.96

Source: designed by the Author.

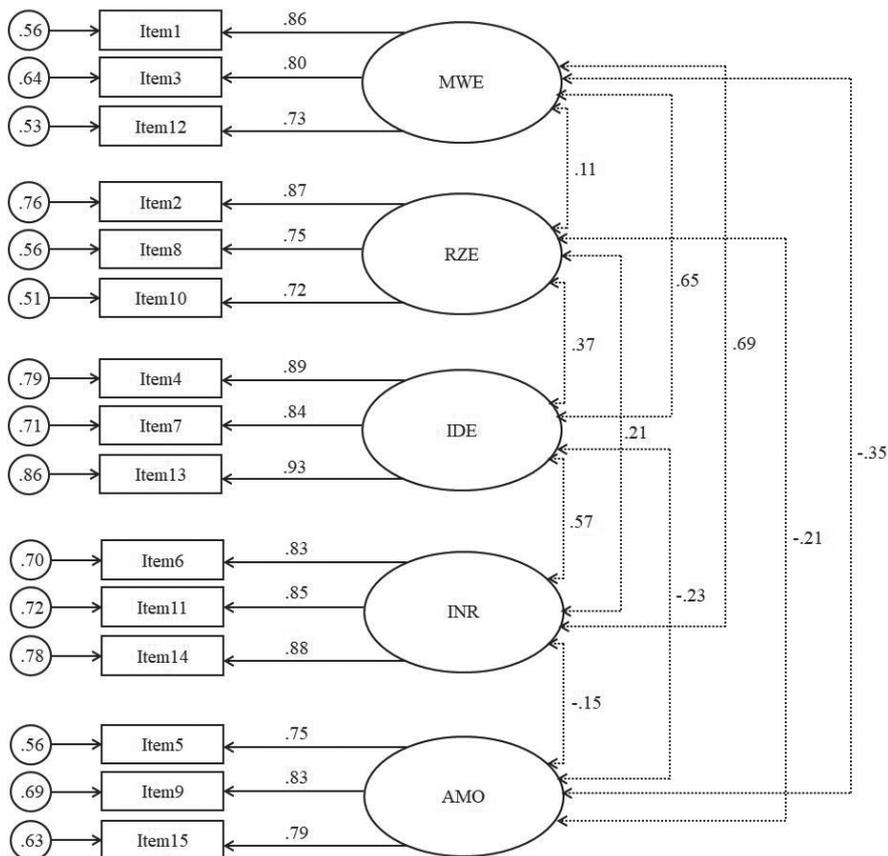


Figure 1.

A five-factor model of the SMS-15 scale in CFA.

Explanation of abbreviations for subscales: see Table 1.

Source: designed by the Author.

In order to determine the convergence and discrimination validity, the correlation between the results of the SMS-15 scale and the Motivation for Learning Questionnaire (Gózdź, 2015) was analyzed on the example of mathematics students ( $N = 100$ ). The obtained results confirmed the existence of strong, positive relationships between identical dimensions in both questionnaires (convergent validity) and significantly lower or insignificant relationships between divergent dimensions in both questionnaires (discriminant validity).

Correlation coefficients between the dimensions of the SMS-15 scale and the Motivation for Learning Questionnaire are presented in Table 4.

Table 4

*Correlation coefficient between the dimensions of the SMS-15 scale and the Motivation for Learning Questionnaire (N = 100)*

SMS-15	The Motivation for Learning Questionnaire				
	MWE	RZE	IDE	INR	AMO
MWE	.61***	.04	.22*	.37***	-.28**
RZE	.05	.51***	.15	.08	-.10
IDE	.27**	.11	.58***	.22*	-.29**
INR	.35***	.09	.30**	.56***	-.06
AMO	-.23*	-.07	-.27**	-.08	.67***

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

Explanation of abbreviations for subscales: see Table 1.

Source: designed by the Author.

## Reliability

Intrinsic reliability was estimated on the basis of Cronbach's  $\alpha$  coefficients for the SMS-15 subscales. Cronbach's  $\alpha$  coefficient was .84 for the subscales of introjected motivation and regulation by identification, and .82 for the subscales of intrinsic motivation, external regulation and amotivation.

The absolute stability measurement was performed using the test-retest method at an interval of three weeks using the example of the motivation of students to learn mathematics (N = 100). The Student's t-test ( $t = 1.78$ ,  $p = .08$ ) confirmed the fulfilment of the assumption of equal averages for the whole questionnaire in both measurements (Jankowski & Zajenkowski, 2009). The assumption was also fulfilled for each of the subscales. The correlation coefficient between the two measurements distant in time was  $r = .73$  for the whole SMS-15 scale,  $r = .79$  for the intrinsic motivation subscale,  $r = .76$  for the external regulation subscale,  $r = .73$  for the regulation by identification subscale,  $r = .71$  for the introjected regulation subscale and  $r = .67$  for the amotivation subscale. In each case the correlation proved to

be statistically significant ( $p < .001$ ). The obtained results confirmed the stability of the test.

### Test procedure

The task of the respondent is to answer each of the statements (appendix) according to the 7-point Likert scale, where 1 is the answer “I definitely disagree” and 7 is “I definitely agree.” Results for a particular subscale should be summed up. The dimension of intrinsic motivation is formed by the items: 1, 3, 12; external regulation: 2, 8, 10; regulation by identification: 4, 7, 13; introjected regulation: 6, 11, 14; and amotivation: 5, 9, 15.

### Conclusions

Summarizing the presented data analyses, it can be stated that the Situational Motivation Scale SMS-15 for children has satisfactory psychometric values. The questionnaire meets the basic requirements for validity and reliability. SMS-15 can be used by psychologists and pedagogues to evaluate intrinsic motivation, external regulation, regulation by identification, introjected regulation and amotivation in children. The short formula of the scale allows for its application in various clinical groups (inter alia, among children with ADHD/ADD) or in wider scientific research, where a large amount of data is required.

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## Appendix

### Appendix 1: Test items in the SMS-15 Scale

Why are you doing this activity?

1. Because this activity is interesting.
2. Because my relatives (e.g., parents) expect it.
3. Because I enjoy this activity.
4. I do it for my own good.
5. I don't know. Personally, I am not convinced that it is worth doing.
6. Because I can prove to myself that I can work harder than others.
7. Because this activity develops my abilities.
8. Because I am counting on receiving a reward.
9. Personally, I am not convinced that I need it.
10. Because I want to avoid punishment.
11. Because I can prove to myself that I am better than others.
12. Because this activity gives me satisfaction.
13. Because this activity is important to me.
14. Because I can prove to myself that I can be more successful than others.
15. I think this activity is a waste of my time.