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Validation of the Short School Helplessness Scale (SBS-S)

Abstract

Learned helplessness caused by a prolonged stay in an uncontrolled situation manifests itself in cognitive, motivational and emotional deficits. The School Helplessness Scale (SBS) is used to measure the students' learned helplessness which is created at school.

The aim of the current research was to reanalyze the SBS factor validity, the structure of which was previously not fully satisfactory. As a result, the Short School Helplessness Scale was created (SBS-S).

The analysis was conducted on a sample of 1228 high school students and 1170 primary school students in Poland. Internal consistency of SBS-S was estimated using Cronbach's α and Composite Reliability (CR). The criterion validity and construct validity were assessed using confirmatory factor analysis (CFA) as well as convergent and discriminant validity.

SBS-S contains 15 items and a three-factor structure. Reliability is completely satisfactory: for SBS-S $α$: 0.81-0.89; $CR = 0.937$, and for subscales $α$: 0.71 -0.83; CR: 0.79-0.86. Construct validity aspects were confirmed using CFA (CFI = 0.93; TLI = 0.917; SRMR = 0.054; RMSEA = 0.060 (90% C.I. 0.051-0.069)) and Average Variance Extracted (AVE). The criterion validity was also confirmed. The SBS-S correlation with four criterion variables (anxiety, self-esteem, sense of self-efficacy, and motivation to learn) is consistent with the assumed one, both in strength and direction. SBS-S norms for school helplessness of high school students were calculated. Analysis of the reliability and structural validity of SBS-S on various

data sets proves the high stability of psychometric properties of the scale. This confirms the usefulness of SBS-S for scientific research and application in school practice.

Keywords: learned helplessness, Short Scale of School Helplessness (SBS-S), CFA, Average Variance Extracted (AVE), Composite Reliability (CR).

Introduction

The ongoing changes in socio-economic and scientific-technical conditions mean that in the current education system, students' competences in the field of self-education and motivation to undertake it have become important. Research shows that at higher stages of education, a decrease in positive attitudes of students towards school and decreasing motivation to learn can be observed (Ciżkowicz, 2009). A critical attitude towards school is associated with growing demands and experienced school failures. School successes and failures are important for students, and the fear of failure is considered to be one of the causes of alienation, anxiety and depression among children and adolescents (Zorraquino, 2002; Niemierko, 2007; Liew et al., 2014; Brady et al., 2018).

School achievements are the result of the interaction of individual characteristics (e.g. cognitive and emotional processes, personality factors, attribution style, self-esteem and self-efficacy) with the characteristics of the school environment (e.g. relationships with colleagues and teachers, school-family relations) (Filippello et al., 2015; Liu et al., 2016). Increasing difficulties in the content of teaching and increasing school requirements at subsequent levels of education lead to the emergence of a group of students for whom learning is effective and associated with positive emotions, and another group of those who cannot meet the requirements, and for whom low efficiency is the cause of frustration.

Repeated negative experiences in the learning process lead to the reinforcement of the students' belief that they have no influence on the course of events and, as a result, to the learned helplessness (Seligman, 2005).

Learned helplessness

Learned helplessness (LH) is defined as a passive behaviour characterised by an inability to learn, occurring in people who are often subjected to stressful, uncontrolled and inevitable negative events (Abramson et al., 1978; Abramson et al., 1989; Seligman, 2004; Määtta et al., 2007; Maier & Seligman, 2016;).

The model of learned helplessness assumes that the subjects' being in an uncontrolled situation – called helplessness training – makes them learn the lack of relationship between actions and desired outcomes (Seligman et al., 2003). The ineffectiveness of activities experienced by the subjects leads to a lower motivation to generate new activities to achieve the goal. Generalisation takes place over time. The subjects learn that also in the future, their actions will prove ineffective. This expectation of no influence on the occurrence of events leads to learned helplessness, which is accompanied by cognitive, motivational and emotional deficits (Maier & Seligman, 1976). Cognitive deficits are manifested by the expectation of ineffectiveness of actions in new task situations, causing difficulties in recognising the relationship between the behaviour and the correct solution of the task, even if it is generated. Motivational deficits are manifested by a reduction or loss of motivation to take action and resignation from controlling the events. Emotional deficits, arising as a result of a weakened activity, are associated with a sense of threat, fear, helplessness, and hopelessness, and may consequently become the cause of depression, when the uncontrolled situation is aversive (Rosenhan & Seligman, 1994; Sędek, 1995; Raufelder et al., 2018).

Grzegorz Sędek (1995) presented a slightly different approach to the rise of LH. He claims that LH occurs mainly in problematic situations. Long-term, ineffective cognitive activity and the lack of progress in solving the problem constitute the helplessness training and lead to cognitive exhaustion, which is accompanied, apart from the cognitive deficit, by the loss of motivation and negative emotions. It is an information model concerning a subset of behaviours from a broader group of behaviours explained by the LH model (Abramson et al., 1978).

Research on LH in various fields and contexts has shown its negative impact on both the physical and mental functioning of the individual (Fincham & Cain, 1986; Maier & Watkins, 2005; Peterson, 2010; Rius-Ottenheim et al., 2013; Filippello et al., 2015; Sankaran, 2018).

By focusing in particular on the school environment, LH can influence students' school achievement as it is associated with numerous psychological variables that play an important role in learning (e.g., sense of self-efficacy, self-representation, self-esteem, motivation and anxiety) (Peixoto & Almeida, 2010; Macher et al., 2012). Research also proves the mediating role of intellectual helplessness in the relationship between the threat of stereotype and school achievement (Bedyńska et al., 2019; Bedyńska et al., 2020). In the school situation, students at risk of LH are characterised by an internal, stable and global

style of explaining failures and an external, unstable and specific explanation of the causes of success (Försterling, 2005). Negative expectations about results, lack of belief in one's own abilities, and pessimistic interpretation of events due to irrational beliefs become the "self-fulfilling prophecies." People who are helpless in difficult situations do not take action despite their abilities. This results from the difficulties in recognising the relationship between actions and their consequences (Ruthig et al., 2008; Dickhäuser et al., 2011; Filippello et al., & Costa, 2014; Sorrenti et al., 2015).

Research objective

The reason for undertaking the SBS validation research was the need to broaden the assessment of the scale validity, with particular emphasis on construct validity, which in the previous studies did not bring fully satisfactory results (Ciżkowicz, 2009). The theoretical basis for the construction of the scale was the LH Seligman model (2002), taking into account cognitive, motivational and emotional deficits. Thus, the main research question concerned the SBS construct validity, i.e. confirmation of the three-factor measurement model. Moreover, the study included convergent and discriminant validity (Fornell & Larcker, 1981), as well as criterion validity.

Based on the cited literature, four criterion variables were adopted: trait anxiety, self-efficacy, general self-esteem and motivation to learn (Gomez et al., 2015), while the variables that served as the criteria in previous research, namely the intellectual helplessness and depression, were omitted (Ciżkowicz, 2009).

Trait anxiety is a theoretical construct meaning "a motive or acquired behavioural disposition that makes an individual susceptible to perceiving a wide range of objectively harmless situations as threatening and reacts to them with states of anxiety disproportionately strong in relation to the size of the objective danger" (Spielberger, 1966, p. 17). Self-efficacy expectancies express the image of the individual's competences, the individual being equipped with means to carry out the intended actions (Bandura, 1997). Self-efficacy determines commitment to a given action and persistence in striving for success. Overall, self-esteem is a relatively constant disposition of a conscious attitude towards oneself. It is a mediator of the relationship between anxiety and cognitive performance. The sense of threat turns out to be irrelevant to low school achievement if we take into account, inter alia, the self-assessment of one's own abilities (Strelau, 2000).

Motivation to learn can be understood as a relatively constant human tendency to achieve specific goals, life tasks and values (Strelau, 2000). If learning stimulates the student's interest enough that additional gratification is unnecessary for the student to engage in learning, this means the occurrence of internal motivation. External motivation is an activity taken as a result of external reinforcements. Research shows that there is a relationship between external and internal motivation. Interest and engagement can be practised and strengthened by means of rewards (Ryan & Deci, 2000).

The correlation of school helplessness with each of these variables should be average; positive with trait anxiety and negative with a sense of self-efficacy, general self-esteem and motivation to learn.

In addition, it was considered justified to verify whether the scale can be used to test school helplessness at a higher level of generality; that is, concerning lessons in general (Table 1) and not only lessons covering a specific subject.

Method

Research group and procedure
The presented results can be divided into two stages. The first stage is research on a sample of 503 people (including 45.3% women) aged 18. Those were students of the second grade of upper secondary schools. 21.7% attended basic vocational schools (ZSZ), 34.0% - technical colleges, and 44.1% were students of high schools (LO). Targeted sampling was used (Babbie, 2004, p. 205).

Students completed a questionnaire containing the School Helplessness Scale (SBS) and scales examining the variables that were to be used to assess the criterion accuracy - the Spielberger questionnaire (STAI X-2) examining **trait anxiety**; Generalized Self-Efficacy Scale (GSES); Rosenberg Self-Esteem Scale (SES) examining the level of general self-esteem and the Scale of Motivation to Learn. In SBS, students rated how often the sensations described in the items on the scale accompany them generally "in class" (Table 1). The surveys were anonymous, and the questionnaires were completed in auditoriums.

The second stage involved assessing the stability of the psychometric properties of the Short School Helplessness Scale (SBS-S). These analyses used data that had previously been collected for a different purpose, using SBS. It should be emphasized that, in these collections, SBS referred separately to experiences "in Polish lessons" and "in math lessons" (Table 1). One set (N = 725; 60% of girls) contained data of students of 2nd grade high school. The second (Borsich

& Deptuła, 2020) and third (Deptuła, 2019) sets are data on primary school students, grades IV[1] (N = 260; 52% of girls) and grades IV-VI[2] (N = 910; 49% of girls; age: M = 11.8; SD = 0.96).

All respondents were students of Polish schools.

Measurement
Learned helplessness is a variable whose level in the school situation was tested by the School Helplessness Scale. The SBS consisted of 20 items concerning the feelings that students experienced during the lessons (e.g. "I am ashamed when I do not understand something"). These feelings can be tested in relation to the lessons in general or in relation to lessons related to a specific subject (e.g. in maths lessons). The respondents answered using a 5-point Likert scale (from 1 - never to 5 - always). There were some reverse-coded items. The sum of points was the indicator of school helplessness. The scale consists of three subscales for the three deficits included in the theoretical model respectively (Ciżkowicz, 2009). The higher the score, the higher the level of school helplessness. Reported reliability is Cronbach's $\alpha = 0.89$.

Student dispositional variables
The **trait anxiety** (STAI X-2) was tested using the Spielberger questionnaire. The respondents answered the items (e.g. "I feel like crying") using a 1-4 Likert scale (from 1 - almost never, to 4 - almost always). The higher the score, the higher the anxiety. Reported Cronbach's α: 0.83 - 0.92.

Self-efficacy was measured by the Generalized Self-Efficacy Scale (GSES) (Juczyński, 2000). The scale consists of 10 items (e.g. "when I'm in a difficult situation, I generally know what to do"). The respondents had a choice of one of four answers, scored from 1 to 4 (reported Cronbach's $\alpha = 0.85$).

Overall self-esteem was studied by the Rosenberg Self-Esteem Scale (SES) (Łaguna et al., 2007). SES consists of ten items (e.g. "I believe I have many positive qualities"). Scores range from 10 to 40 points (reported Cronbach's α = 0.81–0.83).

Motivation to learn was measured with a 35-item scale (e.g. "without learning, my life would be equally meaningful"; Ciżkowicz, 1999). The respondents answered using a 1- 5 Likert scale (from 1 - I strongly disagree to 5 - I strongly agree). The Cronbach's α = 0.92.

Data analysis

The data was analyzed using IBM SPSS Statistics v.21 and Amos v.21. The data was screened for missing values, multivariate outliers, and normality (skewness<3 and kurtosis <8; Kline, 2015).

Internal consistency was examined by Cronbach's α and composite reliability *(CR*; Fornell & Larcker, 1981) with acceptable values ≥ .7, where Cronbach's α is the lower limit of the range containing the true reliability of scale, and *CR* - the upper limit of this range (Hair et al., 2013, s. 7).

Confirmatory factor analysis (CFA) with the Maximum Likelihood (ML) estimator was used to estimate the construct validity. Goodness-of-fit were assessed using the *χ2/df*, Standardized Root Mean Square Residual (SRMR), Root Mean Square Error of Approximation (RMSEA), Comparative Fit Index (CFI) and Tucker-Lewis Index (TLI). When *χ2/df*< 2, SRMR and RMSEA <0.05 or 0.08 and CFI and TLI> 0.95 or 0.90 the fit of the model is good or acceptable, respectively (Hu & Bentler, 1999).

Nested models comparisons were made by comparing the change in CFI (more than .010) supplemented by a change in RMSEA (more than .015; Chen, 2007). Local fit was estimated by standardized factor loading, factor reliabilities, average variance extracted (*AVE*), standardized residual covariances and modification indices (Schermelleh-Engel & Moosbrugger, 2003; Tabachnick & Fidell, 2013).

Additionally, the convergent validity was assessed using *AVE*, the value of which should exceed 0.5 for each factor (Fornell & Larcker, 1981; Hamid et al., 2017). Discriminant validity was assessed by comparing the square roots of the *AVE* with the correlation coefficients with the other factors. The AVE for each factor should be at least .5 and exceed the squared correlations with the other factors (Hair et al., 2017; Netemeyer et al., 2003).

Results

Twenty items on the School Helplessness Scale were analyzed quantitatively (item-total correlation, reliability and CFA) and qualitatively. As a result, five items were removed from the SBS (No. 3, 4, 9, 13, 15) (Ciżkowicz, 2009).

The results presented below mainly concern SBS-S. Evaluation of the reliability and validity of the SBS was also presented only for reasons of comparison.

Items analysis

The Short School Helplessness Scale (SBS-S) consists of 15 items (5 for each factor). Six items are reverse coded (4, 8, 10, 12, 14, 15). Table 1 presents descriptive statistics, item-total correlation and the assignment of items to subscales.

Table 1. Descriptive statistics and item-total correlation SBS-S (*N=503*).

Items SBS-S		D	M(SD)	r_{it}
In lessons[a]:				
1. I am ashamed when I do not understand something		E	2.60(1.08)	.43
2. I'm afraid that I will be asked		E	3.34(1.21)	.50
3. I feel like I'm wasting my time		M	2.89(1.17)	.45
4. I work on my own	(R)	P	2.19(.88)	.23
5. I'm terribly bored		M	2.79(1.12)	.40
6. I'm afraid I'll make a fool of myself		E	2.58(1.19)	.45
7. I'm afraid to speak up		E	2.36(1.16)	.50
8. I know the answer to the questions asked by the teacher (R)		P	2.66(.71)	.42
9. I'm sad and embittered		E	2.11(1.00)	.45
10. I understand what the teacher explained	(R)	P	2.42(.85)	.42
11. I can't wait for the end of the lesson		M	3.87(1.03)	.37
12. I'm eager to learn	(R)	M	3.21(1.02)	.39
13. I'm thinking about sweet nothing		M	2.93(1.05)	.33
14. I do the tasks easily	(R)	P	2.56(.83)	.47
15. I understand everything	(R)	P	2.82(.95)	.46

Source: Author's research.

note: [a] – or „in math lessons" or other subjects; r_{it}– item-total correlation; D-deficit; E-emotional; M-motivational: P-cognitive; R - reverse coded item

Item 4 was left on the scale despite its low item-total correlation. Its removal lowered the construct validity of the scale.

Reliability

Descriptive statistics for SBS-S and its subscales were presented in Table 2. Item 4 in the subscale (cognitive deficit) has item-total correlation of 0.38 and is the only item in subscales with r_{it} <0.40. The reliability of the SBS-S measurement and its subscales are fully satisfactory. Reliability comparison for SBS-S and SBS proves lower or equal α values and higher *CR* values for SBS-S.

Table 2. Descriptive statistics and reliability SBS-S and SBS and their subscales (*N*=503).

Scale	SBS-S				SBS	
	M(SD)	r_{it}	α	CR	α	CR
SBS-S (SBS)	41.34(7.99)	.23-.50	.806	.937	.840	.925
deficits:						
cognitive	12.66(3.10)	.38-.64	.783	.843	.783	.794
emotional	12.99(4.31)	.48-.72	.819	.864	.828	.858
motivational	15.70(3.66)	.44-.49	.706	.786	.760	.761

Source: Author's research.

Construct validity

Goodness-of-fit statistics for a measurement models are given in Table 3. The M1 model contains three correlated factors, each of which has 5 indicators (without cross-loadings, Fig. 1).

Table 3. Goodness-of-fit indices of the models SBS (20 items) and SBS-S (15 items).

Model	χ^2	df	CFI	ΔCFI	TLI	SRMR	RMSEA (90%C.I)	ΔRMSEA
					SBS (20 items)			
M1	733.06	167	.821		.796	.090	.082 (.076-.088)	
					SBS-S (15 items)			
M1	340.32	87	.888		.864	.073	.076 (.068-.085)	
M2	233.87	84	.934	.046	.917	.054	.060 (.051-.069)	.016

Note. M2 – M1 with cross-loadings (SBS2, SBS12 andSBS17); all χ^2 values were significant (*p*<0.001)

Source: Author's research.

For SBS, all goodness-of-fit indices of the M1 model indicated a poor fit (Table 3). There were also numerous local poor fits. Both the global and the local M1 fit for SBS-S was slightly better. SRMR and RMSEA met the criteria, and CFI and TLI had increased significantly and were close to acceptable values. As a result of the analysis of local poor fit, three cross-loadings (M2; Fig. 1) were introduced into the M1 model. The fit of M2 was acceptable and significantly better than M1 (ΔCFI and ΔRMSEA). Only χ^2/df for each model did not meet the criterion (it's > 2).

Fig. 1 presents standardized factor loadings and correlations between factors for the M2 model. They were all highly significant.
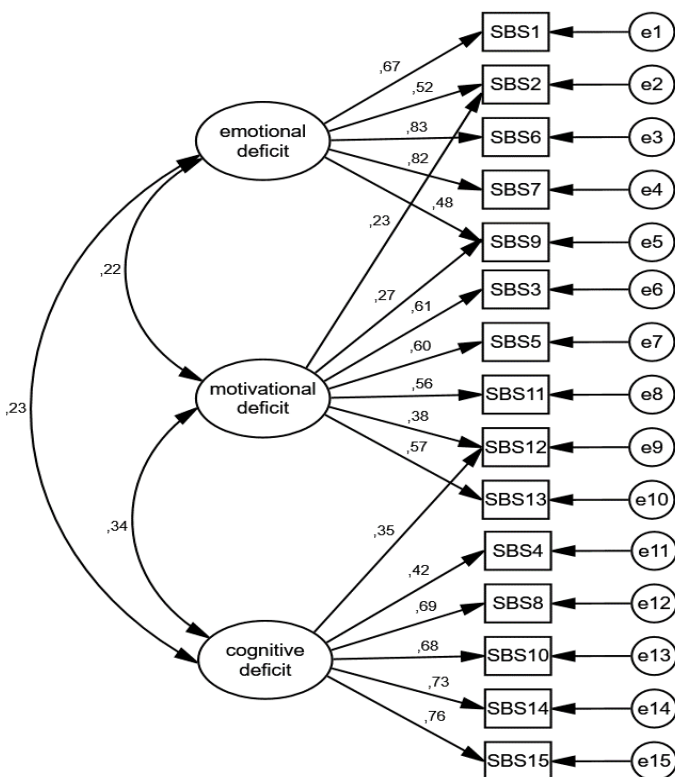

Figure. 1. Measurement model M2 (M1 with cross-loadings: SBS2, SBS12 and SBS17); all standardized factor loadings and correlations are statistically significant (p < 0.001); N=503.

Source: Author's research.

Convergent and discriminant validity

Table 4 includes Pearson's correlation coefficients between factors and *AVE* for each factor.

Table 4. Pearson's correlation coefficient and *AVE* for subscale SBS-S (*N*=503).

Deficits:	AVE	cognitive	emotional	motivational
cognitive	.52	**.72**		
emotional	.56	.22	**.75**	
motivational	.43	.34	.28	**.66**

Note. Diagonal values (bold) - square roots of *AVE*; beyond the diagonal - Pearson's correlation coefficient (*p*<0.001).
Source: Author's research.

Convergent validity was analyzed for *AVE* (Table 4). The *AVE* values for cognitive and emotional deficits met the criterion (*AVE*> 0.50). Only for motivational deficits was AVE slightly below the recommended cutoff.

The discriminant validity of SBS-S was assessed by comparing *AVE* with factor correlations. Each of the three factors in SBS-S meets the Fornell and Larcker (1981) criterion, according to which the square root of the *AVE* for each factor should be higher than its correlation with the other factors. This proves that the factor explains the variance of its own indicators better than the variance of other factors, and this confirms the discriminant validity of the scale.

Criterion validity

The results of the SBS-S criterion validity assessment and the reliability of the measurement of criterion variables are presented in Table 5.

Table 5. Pearson's correlation coefficient SBS-S and its subscales with criterion variables (*N*=503).

Scale	STAI	GSES	SES	motivation
SBS-S	.486[***]	-.383[***]	-.480[***]	-539[***]
Deficits:				
emotional	.555[***]	-.353[***]	-.517[***]	-.113[*]
motivational	.270[***]	-.179[***]	-.270[***]	-.594[***]
cognitive	.160[***]	-.282[***]	-.196[***]	-.527[***]
Cronbach's α	.84	.84	.84	.91

Note. STAI – trait anxiety; GSES – generalized self-efficacy; SES – self-esteem; [*]- *p*<0.05; [***]- *p*<0.001
Source: Author's research.

According to the adopted assumptions, school helplessness correlated with the criterion variables at the average level, with positive correlation with anxiety, and negative correlation with the other variables. There was a visible stronger correlation of anxiety with the emotional deficit, lower correlation with the motivational deficit, and the weakest correlation with the cognitive deficit. Motivation to learn was most strongly correlated with the motivational deficit, while its relationship with the emotional deficit was clearly lower, although significant. The strength of the relationship between school helplessness and the criterion variables and their direction confirmed the criterion validity of SBS-S.

Study of the stability of SBS-S psychometric properties

The SBS-S reliability and construct validity analysis was repeated using data obtained for other purposes. This allowed the stability of the scale structure to be assessed. The results were summarized in Tables 6 and 7, respectively. It should be remembered that in each of these studies, the measurement of school helplessness concerned Polish language and math lessons separately.

Table 6. Coefficient Cronbach's α scale SBS-S and its subscales.

	$N=725$		$N=260$		$N=910$	
	in math	in Polish lessons	in math	Polish language	in math	in Polish lessons
SBS-S	.854	.880	.873	.887	.875	.884
deficits:						
cognitive	.833	.825	.759	.805	.816	.832
emotional	.739	.780	.750	.787	.788	.805
motivational	.792	.839	.772	.823	.818	.832

Sources: Author's research.

In each of the three analyzed sets, the reliability is fully satisfactory for both the scale (α: 0.85-0.89) and the subscales (α: 0.74-0.84).

Table 7. Goodness-of-Fit Indices of the SBS-S (15 items).

M (df)	χ^2	χ^2/df	CFI	Δ CFI	TLI	SRMR	RMSEA (90%C.I)	ΔRMSEA
			secondary school – school helplessness in math ($N=725$)					
M1(87)	337.15***	3.9	.933		.919	.059	.063 (.056-.070)	
M2(84)	242.12***	2.9	.957	.024	.947	.040	.051 (.044-.059)	.012

Table 7. Goodness-of-Fit Indices of the SBS-S (15 items).

M (df)	χ^2	χ^2/df	CFI	Δ CFI	TLI	SRMR	RMSEA (90%C.I)	ΔRMSEA
		secondary school – school helplessness in Polish lessons (N =725)						
M1(87)	467.23***	5.4	.913		.895	.067	.078 (.071-.085)	
M2(84)	297.87***	3.5	.951	.038	.939	.044	.059 (.052-.067)	.023
		primary school – school helplessness in math (N=260)						
M1(87)	124.87**	1.4	.964		.957	.046	.041 (.023-.056)	
M2(84)	119.76**	1.4	.966	.002	.958	.044	.041 (.022-.056)	.000
		primary school – school helplessness in Polish lessons (N=260)						
M1(87)	170.45***	2.0	.940		.928	.054	.061 (.047-.074)	
M2(84)	137.93***	1.6	.961	.021	.952	.046	.050 (.034-.064)	.008
		primary school – school helplessness in math (N=910)						
M1(87)	333.32***	3.8	.951		.940	.051	.056 (.050-.062)	
M2(84)	195.25***	2.3	.978	.027	.972	.030	.038 (.031-.045)	.018
		primary school – school helplessness in Polish lessons (N=910)						
M1(87)	433.67***	5.0	.937		.924	.061	.066 (.060-.072)	
M2(84)	213.68***	2.5	.977	.040	.971	.032	.041 (.034-.048)	.025

Source: Author's research.

In Table 7, the fit indices for the M1 model (without cross-loadings) were acceptable in all sets, except for the helplessness of high school students in Polish language lessons; in this case, too, only the TLI slightly did not meet the criterion. The introduction of cross-loadings (M2 model) always improved the fit, although not always significantly. The smallest change in alignment occurred for school helplessness in math lessons in primary school students (*N = 260*). The SBS-S construct validity was confirmed in each data set.

Comparing the results in Tables 3 and 7 allowed for some generalization. Bearing in mind that the results in Table 3 refer to school helplessness in classes, and the results in Table 7 of school helplessness in classes of a strictly defined subject (in this case Polish language and math), it is visible that the M1 and M2 model matching was better for data on helplessness in specific subject classes.

Norms for general school helplessness in high schools

Presenting the result of school helplessness against the background of the reference group requires norms. Previous studies have shown significant differences between the school helplessness of primary and high school students in specific subjects (Ciżkowicz, 2009). Such differences can be expected also in

the case of school helplessness experienced generally during lessons. Therefore, in order to develop standards, it is necessary to collect relevant empirical data from representative samples.

Temporary norms for high schools were presented in Table 8. They were developed on a non-representative sample (N = 503). The distribution of school helplessness did not require normalization (K-S test: d = 055; p <.10).

Table 8. SBS-S norms for secondary school.

Sten	Raw-score	Sten	Raw- score
1	15-24	6	41-44
2	25-28	7	45-48
3	29-33	8	49-52
4	34-36	9	53-57
5	37-40	10	58-75

Source: Author's research.

Stens 1-4 are interpreted as low school helplessness, 5-6 as average, and 7-10 as high.

Summary

During lessons, teachers can observe students who are helpless, discouraged and give up learning. This sometimes applies to school education in general, sometimes only to specific subjects, among which math has a special place.

In the context of these observations, it seems important to provide a valid and reliable tool to identify helpless behavior of students (Yates, 2009). This diagnosis is especially justified in a situation where effective psycho-educational programs are available that allow to reduce school helplessness and change irrational beliefs of students (Ulusoy & Duy, 2013).

The School Helplessness Scale was a tool of high and stable reliability (α = 0.89). However, the assessment of various aspects of validity caused some dissatisfaction. Construct validity was assessed by the EFA, in which three factors explained 46% of the variance, and the factor loadings did not fully confirm the expected structure (Ciżkowicz, 2009).

The presented research extended the estimated aspects of validity and additionally provided information on the functioning of the scale at a higher level of generality. The students assessed their feelings in classes in general and not, as

in the previous studies of the scale, during lessons of a specific subject (see Table 1). As a result of the analyses, the Short School Helplessness Scale (SBS-S) was obtained, which consists of 15 items (Table 1).

Validation studies have shown that SBS-S is a reliable and valid tool. Both Cronbach's α and *CR* (Tables 2 and 6) indicated high reliability of SBS-S (> 0.81) and fully acceptable reliability of subscales (> 0.71). Construct validity was confirmed using CFA (Tables 3 and 7) and convergent and discriminant validity with the *AVE* analysis (Table 4) (Fornell & Larcker, 1981). The criterion aspect of validity was also confirmed using four variables that correlated with school helplessness at the average level, where for trait anxiety, the direction of relationship was positive, and for the three remaining variables (the level of self-esteem, self-efficacy and motivation to learn) - negative (Table 5).

Additional analyses of reliability and construct validity assessed on various datasets confirmed the high, stable psychometric properties of SBS-S, and the established temporary norms for high school students make it possible, in this age group, to relate the raw score to population results.

It is worth noting that although in the case of two slightly different ways of using SBS-S - to study school helplessness in lessons in general and in lessons of a specific subject - the psychometric properties of the scale were fully satisfactory, but in the second case, they were slightly better (see Tables 2 and 6; 3 and 7). These better assessments of the reliability and validity of SBS-S obtained for measurements on a specific subject of teaching reinforced the thesis of the possibility of occurrence, apart from school helplessness covering general school education, of helplessness connected with a specific field of knowledge or a specific subject of study. Similar conclusions were formulated in previous studies on helplessness in learning math and linguistic subjects (Krejtz & Nezlek, 2016).

The presented psychometric properties of the SBS-S proved the usefulness of the Short School Helplessness Scale for research and application in school practice.

Limitations of the current study

While this study has led to important conclusions, it also has certain limitations. The norms for secondary school students (Table 8) should be treated as temporary as they were developed on a non-representative sample. There is also a lack of primary school student norms. This requires further research, and the development of standards for primary school students must be preceded

by an in-depth analysis of changes in the behavior of the helpless in this age group.

Moreover, all data for the assessment of criterion validity were collected using self-descriptive scales. Other data collection methods should also be used (e.g. teacher reports; Fincham et al., 1989; Yates, 2009). Collecting information from various sources increases the reliability and adequacy of assessments, especially in children and adolescents (Gugliandolo et al., 2015).

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