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FACTORIAL STRUCTURE OF THE CREATIVE SELF SHORT SCALE: A POPULATION STUDY OF HIGH SCHOOL STUDENTS IN ROMANIA

Mirela PANDELICA,
Moldova State University

Creative self-efficacy has become one of the most relevant constructs in education, being correlated with self-motivation, increased personal competence of students, creative performance, and their overall ability to produce creative work. A sense of creative self-efficacy and its application in a variety of circumstances can have an impact on students' work at school as well as beyond the educational environment. The present study south to translate the Short Scale of Creative Self (SCSS) into Romanian and to evaluate its psychometric properties. SCSS is an instrument capable of assessing students' creative self-efficacy and its development, an approach of interest in the educational environment, not only for students but also for parents, teachers, educational counselors, and educational policymakers focused on developing programs and interventions to cultivate and harness creative potential.

Keywords: *creativity, factor structure, high school students, internal consistency.*

STRUCTURA FACTORIALĂ A SCALEI SCURTE A SINELUI CREATIV: UN STUDIU POPULAȚIONAL PE ELEVII DE LICEU DIN ROMÂNIA

Autoeficacitatea creativă a devenit unul dintre cele mai relevante constructe în educație, ea fiind corelată cu automotivarea, creșterea competenței personale a elevilor, performanța creativă și capacitatea generală a acestora de a produce lucrări creative. Sentimentul de autoeficacitate creativă și aplicarea acestuia în diverse circumstanțe poate avea un impact asupra activității elevilor la școală, precum și dincolo de granițele mediului educațional.

Studiul de față a avut ca scop traducerea în limba română a „Scalei scurte a sinelui creativ" (SSCS) și evaluarea proprietăților psihometrice ale acesteia. SCSS este un instrument capabil să evalueze autoeficacitatea creativă a elevilor și evoluția acesteia, demers important în educație, nu doar pentru elevi, ci și pentru părinți, educatori, psihologi, cercetători și factorii de decizie politică implicați în conceperea de programe și intervenții pentru a crește potențialul creativ.

Cuvinte-cheie: *consistență internă, creativitate, elevi, structură factorială.*

Introduction

Creativity is one of the extensively studied concepts in psychology. Initially, research focused on creative individuals and personalities but later shifted towards the broader population. Today, creativity is considered a crucial skill for our century in various fields, such as organizations [2], business [26], sociology [9], psychology [13], and more. In the educational environment, creativity is considered essential and is consistently present in educational programs and policies. Research in the field has demonstrated that creativity is a necessary component for both academic success and beyond the boundaries of the school [1; 15; 16; 35]. Additionally, creativity can contribute to admission into academic institutions, the development of career opportunities, and greater economic benefits [5; 10; 12; 35]. In the sphere of education, creativity is seen as the ability to produce multiple ideas [10] its purpose being to provide a unique, original, correct answer different from the conventional one traditionally taught in classrooms [30]. Although the educational perspective on creativity often focuses on its artistic side [30], creativity is present in all areas and aspects of learning [11]. In this regard, Guilford (1950), for example, states that "a creative act itself is an example of learning ... [and that] a comprehensive theory of learning must consider both understanding and creative activity" [Guilford, apud 30, p. 446].

However, studies have demonstrated that creativity alone is not sufficient. In this regard, Barbot and his colleagues (2016) have shown that creativity emerges from the interaction between creative potential and creative production, requiring motivation to be put into practice [7].

The fact that the transformation of creative potential into creative behavior depends on an individual's international action shaped by confidence in creative ability, demonstrates that belief systems play a crucial role developing creativity. This includes creative self-awareness, creative self-image, and beliefs in creative confidence [17]. The latter is an essential trait for creative action, as it reflects an individual's confidence in their ability to think or act creatively in a specific domain, encompassing the concepts of creative self and creative self-efficacy (CSE) [17]. Recent research has highlighted that students' attitudes toward creativity, particularly their beliefs in their creative capacities[18], play a significant role in engaging in creative activities, as well as in explaining successes and failures in being creative in life in general [16].

Creative Self-Efficacy and Creative Personal Identity

Initially studied in an organizational context [16; 35; 28], creative self-efficacy has become a highly researched topic in the field of education [3]. Defined as "the belief one has the ability to produce creative outcomes" [35, p. 1138], creative self-efficacy originates from Bandura's (1997) construct of self-efficacy.

According to Bandura (1997), self-efficacy influences what a person attempts to achieve and how much effort they are willing to invest in the process. Therefore, creative self-efficacy (CSE) reflects the self-assessment of one's own abilities or creative potential, which, in turn, influences the choice of activity and the effort invested in achieving innovative results [33].

In practice, "CSE is more probabilistic, hypothetical, and concerns self-perception of one's potential for creative activity and development" [18, p. 46]. CSE is domain-specific, strongly tied to particular areas of activity [19; 24; 29], or even specific to tasks [31]. On the other hand, previous theorizations have postulated that CSE can also serve as a person's general belief in their abilities for creative thinking or creative problem-solving, meaning it can serve as a general trait-like characteristic rather than a dynamic, state-like CSE, akin to the concept of creative self [18]. Creative Personal Identity (CPI) [20] differs conceptually from Creative Self-Efficacy (CSE). CPI refers to the extent to which creativity is a significant part of an individual's identity [16; 35]. CSE and CPI are similar but not identical, and they mutually influence each other. In youth, creative self-efficacy may have a stronger impact on creative personal identity [18]. Creative Self-Efficacy (CSE) and Creative Personal Identity (CPI) undergo changes with age [20], influenced by the interaction of various factors, including psychological and personality-related factors [18], as well as social factors such as the influence of teachers or peers [18], and educational experiences [28].

The Importance of Creative Self-Efficacy in Education

Educators link creative self-efficacy to academic skills [25]. In this regard, students who perceive themselves as incapable of accomplishing a task (such as mastering a mathematical concept or writing an essay) may underperform due to a lack of creative self-efficacy [34]. Other research has identified the relationship between creative self-efficacy and learning motivation [36] and academic performance [25]. On the flip side, it has been found that creative self-efficacy may play a role in diminishing self-confidence and increasing procrastination [27].

Karwowski (2012) studied the relationship between creative self through its two constructs, namely creative self-efficacy and creative personal identity, and dispositional curiosity, indicating that curiosity tends to lead to increased self-efficacy rather than establishing a relationship between the two concepts. Finally, the relationship between creative self-efficacy and academic performance and improved student grades, has been demonstrated [34].

Structural equation modeling was employed to assess responses for both studies. A satisfactory model fit was found. In Study 1, significant effects were discovered between creative self-efficacy and task accomplishment/self-approach goals, which was investigated as a singular construct. Puente-Diaz and Cavazos-Arroyo (2016) discussed the significance of creative self-efficacy in task accomplishment goals without identifying a significant relationship between the constructs.

A limited number of studies have explored creative self-efficacy in students with disabilities. Since creative self-efficacy is considered a predictor of success in life, it becomes an important construct for these students to prepare them for college and career [34].

Measuring CSE and CPI

Given the crucial role of Creative Self-Efficacy (CSE) in various domains, reliable psychometric tools for measuring this construct are essential. Previous studies have relied on short scales to measure both CSE and Creative Personal Identity (CPI). For example, Beghetto (2006) used three items: "I am good at coming up with new ideas"; "I have lots of good ideas"; "I have a good imagination" (see also Karwowski, 2011). Subsequently, the Short Creative Self Scale (SSCS) was developed in response to the need for a more elaborate measurement of CSE [8; 23]. The statements in the questionnaire were created based on the definitions of creative self-efficacy and creative self-concept (see Beghetto& Karwowski, 2017). Out of the initially developed 20 items, 11 were retained. Initially, it was assumed that six of them measured creative self-efficacy (CSE), four measured creative personal identity (CPI – the belief that creativity is an important element of self-characterization), and one was included with the intention of measuring perceived creativity.

Analyses have demonstrated that SSCS consists of 11 items, with responses on a five-point Likert scale, six of which measure Creative Self-Efficacy (CSE), and five items measure Creative Personal Identity (CPI). CSE is often studied together with CPI, but both subscales, CSE and CPI, can be used as standalone self-report scales [18, p. 48]. Specifically, CSE is described by the following six statements: Item (3) "I know I can efficiently solve even complicated problems", Item (4) "I have confidence in my creative abilities", Item (5) "Compared to my friends, I stand out with my imagination and ingenuity", Item (6) "I have often demonstrated that I can handle difficult situations", Item (8) "I am sure I can handle problems that require creative thinking", and Item (9) "I am good at proposing original solutions to problems" [18, p. 48].

In Romania, there is an article where the test was validated on adult Romanian people, [4], but we consider that it is mandatory its adaptation on teenagers as creativity represents an important dimension of personality and during adolescence we can intervene on its development as well as on the self-creative.

Method

Study Objective

The present study sought to translate the Short Scale of Creative Self (SSCS) developed by M. Karwowski (2011) into Romanian and assess its psychometric properties through exploratory and confirmatory factor analysis, as well as internal consistency.

Participants

The study involved 123 high school students from grades IX-XII, aged 15-18 years (M=16.57; SD=1.08). Among them, 48 (39.03%) were boys, and 75 (60.97%) were girls, belonging to two different high school from urban area, studying in different specializations (mathematics-informatics, natural sciences, philology, social sciences). The psychometric data analyzed were based on responses obtained from 100 subjects.

The research call was made through classroom announcements by homeroom teachers. Participation in the study was voluntary, with no rewards offered, based on informed consent signed by parents. The study was conducted with the approval of the school administration. Twenty-three questionnaires were excluded from the analysis because they recorded responses on the same step of the *Likert* scale.

Instruments

The Short Scale of Creative Self (SSCS) [29] is an instrument consisting of 11 items. The items are distributed into two subscales, namely Creative Self-Efficacy (CSE) and Creative Personal Identity (CPI). Responses to items are recorded on a 5-point *Likert* scale, where 1 - strongly disagree and 5 - strongly agree.

The original version showed good psychometric properties, with internal consistency values ranging from .84 for CSE and .83 for CPI.

Procedure

The questionnaire was generated and administered online through the Google Forms. Each questionnaire was accompanied by a demographic scale.

Participants were asked to complete responses to the statements of the Short Scale of Creative Self

(SSCS), a questionnaire comprising 11 items. The questionnaire items were successfully translated into Romanian and back-translated into English by a university professor.

Results and Discussions

Descriptive statistics were calculated to assess whether the participants' responses follow a Gaussian distribution. Considering that the evaluation scale of the questionnaire is on a five-point scale, with an average as close to the theoretical average of the assertion scale being 3.00, this demonstrates that, overall, in the assessment of an assertion, responses are equally distributed in the acceptance and rejection directions. At the same time, we analyzed the assertions based on Skewness and Kurtosis values (symmetry and kurtosis), aiming for them to have a value as close to 0 as possible, to respect a symmetric distribution and typical kurtosis for the profile of a normal curve (Gaussian curve). The arithmetic mean obtained for the items was 3.24 (ranging from 3.22 to 4.04), with a standard deviation mean of .59 (ranging from .93 to 1.24). The skewness index obtained was -.30 (ranging from -.07 to -1.03), and the kurtosis index was -.68 (ranging from .22 to -1.09), indicating a distribution with slight negative skewness. Considering the nature of the items and that the sample was drawn from the general (nonclinical) population, as expected, a tendency toward high scores could be expected. The distribution indices of the scores obtained on the 11 scale items adhere to the characteristics of a normal distribution, as seen in Table 1.

Table 1. Results of Exploratory Factor Analyses-SSCS.

Items		CSE	CPI	M	S.D.	Skewness	Kurtosis
i_1	I think I am a creative person		,729	3,65	,936	-,071	-,887
i_2	My creativity is important for who I am		,844	3,33	1,240	-,071	-1,094
i_3	I know I can efficiently solve even complicated problems	,625		3,43	,987	-,380	-,321
i_4	I trust my creative abilities		,665	3,61	1,188	-,488	-,719
i_5	My imagination and ingenuity distinguish me from my friends		,595	3,28	1,190	-,085	-,967
i_6	Many times, I have proved that I can cope with difficult situations	,674		4,04	1,072	-1,034	,224
i_7	Being a creative person is important to me		,828	3,66	1,208	-,332	-1,090
i_8	I am sure I can deal with problems requiring creative thinking	,714		3,48	1,030	-,398	-,242
i_9	I am good at proposing original solutions to problems	,618		3,34	1,121	-,094	-,527
i_10	Creativity is an important part of myself		,813	3,22	1,151	-,079	-,746
i_11	Ingenuity is a characteristic which is important to me		,530	3,64	1,078	-,322	-,768

An exploratory factor analysis was conducted to examine the theoretical validity of the instrument. The adequacy of the sample and the usefulness of factor analysis for data reduction were examined through the Kaiser-Meyer-Olkin (KMO) and Bartlett tests. The KMO test result for sample adequacy was .87, indicating that the data are suitable for factor analysis. Also, the significance of the Bartlett test was .000, suggesting the usefulness of factor analysis [$\chi 2$ (55) = 500.072, p = 0.000]. The obtained values indicate the presence of one or more common factors, justifying the application of a factor reduction procedure. The solution based on the Kaiser criterion (eigenvalue > 1) suggested a structure with two factors, accounting for 60.73% of the total variance. The first extracted eigenvalue was 5.16, and the next was 1.51, which can be interpreted as an index of a higher-order factor, with the explanatory power of the first factor being significantly superior to the subsequent factors. The parallel analysis method was used to verify the appropriate selection of the number of factors. Both the Scree plot (Figure 1) and Horn's parallel analysis (Figure 2) suggested retaining two factors.

As the model indicated by the authors is a hierarchical model and the communality ranged between .754 and .443, the analysis continued with studying the original model proposed by the authors.

Figure 1. Scree plot for SSCS.

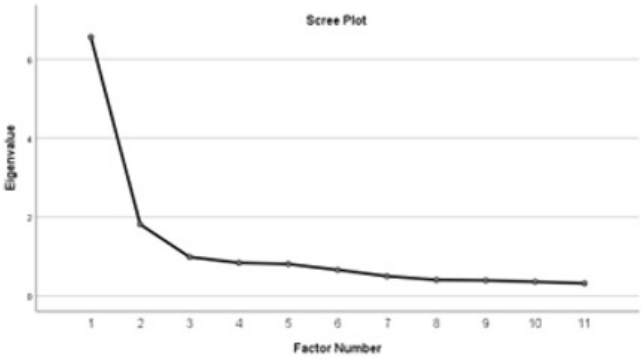
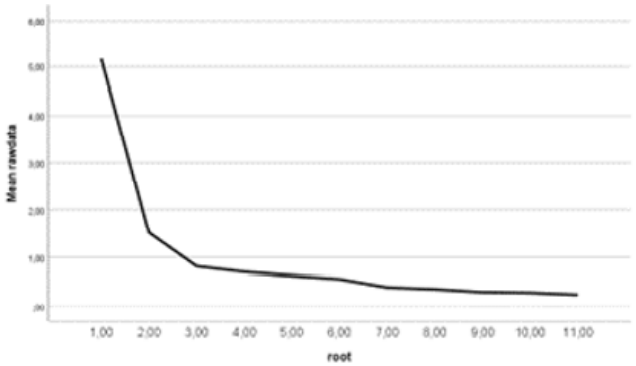
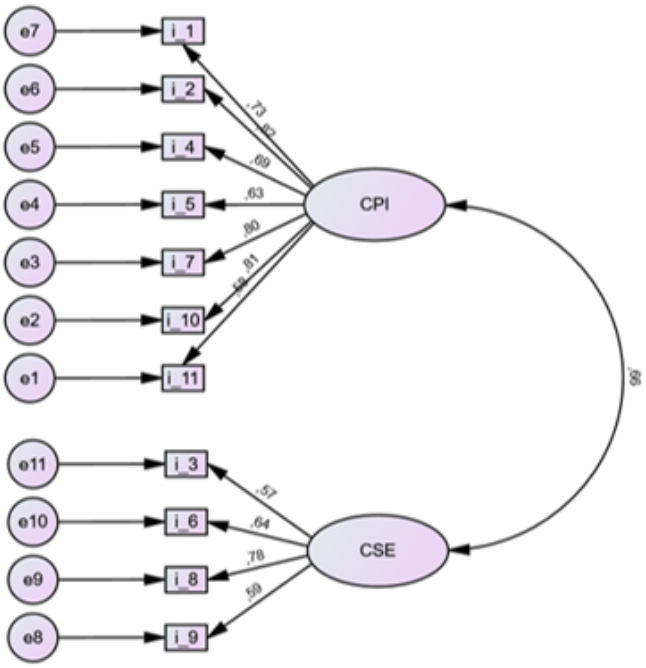


Figure 2. SSCS parallel analysis.



The factorial structure obtained through confirmatory factor analysis (CFA) is presented in Figure 3.

Figure 3. CFA Structure.



The obtained factorial structure loaded all items, distributed on the two subscales, namely CSE and CPI, similar to the original model. Notably, there is a higher loading of items on the CPI subscale compared to the model proposed by Karwowski (2011). Similar to the original model, item 1 (I believe I am a creative person), intended to measure self-perceived creativity, loads on the CPI subscale, as well as items 4 and 5, which, according to the original model, belong to the CSE subscale. This may be due to cultural differences, which need to be investigated in further analyses. Despite these differences with the original conceptualization, the data analysis demonstrates that the two-factor model fits well ($\chi 2/df = 1.98$; CFI = 0.91; NFI = 0.83; RMSEA = 0.08). The scales were characterized by significant internal consistency. Descriptive statistics of the scales, intercorrelations, and reliability indices (Cronbach's α) are presented in Table 2.

Table 2. Descriptive Statistics, Intercorrelations, and Scales Consistencies.

Factor	M	S.D.	Cronbach's Alpha	CSE	CPI
CSE	3,57	-.093	.747	.747	.505***
CPI	3,40	.98	.882		.882

*Note: N = 100, ***p < .001, Cronbach's α on the diagonal.*

Indices of internal consistency obtained reveal the fact that a standardized and relevant creativity assessment questionnaire was obtained.

Regarding the discriminant validity, the two subscales of the SSCS showed a positive intercorrelation (r=.505, p=.000). This result is expected, because each factor describes a specific dimension of the construct, as well as an interrelationship between the factors.

Conclusions

In the educational field, the importance of education is universally recognized. In this regard, there is a need for valid and reliable tools to measure various creative self-beliefs. In the present study, the adaptation and validation of the Creative Self Scale on the sampleof Romanian students revealed the development of an instrument with important psychometric qualities. Confirmatory factor analysis supported the original structure of the SSCS scale with two subfactors, according to the original model. Regarding reliability, the results showed significant internal consistency indices for both subfactors. The empirical approach undertaken revealed a valid, reliable, and valuable instrument for assessing self-beliefs about creative self, creative self-efficacy, and creative personal identity in students but we consider that it is mandatory its adaptation on teenagers as creativity represents an important dimension of personality and during adolescence we can intervene on its development as well as on the self-creative. The instrument can successfully complement the battery of creativity assessment tests, a process of interest for parents, educators, educational psychologists, researchers, and policymakers involved in designing programs and interventions to nurture and enhance creative potential.

We consider that the trust in the creative potential of the Romanian school represents a priority, as the teenager must be educated in creation, the identification of which through a test representing the moment when one can intervene with supportive programs and creative actions. For a better utility of SSCS variant for teenagers, we have enclosed the Romanian questionnaire variant, (Annex 1).

Annex 1 SSCS

Mai jos veți găsi mai multe propoziții folosite de oameni pentru a se descrie. Vă rugăm să decideți în ce măsură vă descriu fiecare dintre aceste afirmații. Nu există răspunsuri bune sau greșite.

1 - total dezacord; 2 - oarecum dezacord; 3 - nici da, nici nu; 4 - oarecum acord; 5 - total acord.

1. – Consider ca sunt o persoană creativă.
2. – Creativitatea mea este importantă pentru cine sunt eu.
3. – Știu ca pot rezolva eficient chiar şi probleme complicate.
4. – Am încredere în abilităţile mele creative.
5. – Imaginația și inventivitatea mea mă diferenţiază de prietenii mei.
6. – De multe ori am demonstrat că pot face faţă unor situații dificile.
7. – Este important pentru mine să fiu o persoană creativă.
8. – Sunt sigur că pot face față problemelor care necesită gândire creativă.
9. – Găsesc soluții originale la problemele cu care mă confrunt.
10. – Creativitatea este o dimensiune importantă a personalităţii mele.
11. – Inventivitatea este o caracteristică importantă pentru mine.

Creative Self-Efficacy: se însumează punctajul la afirmațiile 3, 4, 5, 6, 8, 9 și se împarte la 6; Creative Personal Identity: se însumează punctajul la afirmațiile 1, 2, 7, 10, 11 și se împarte la 5.

Autoeficacitatea creativă

>3 – scor redus
Intre 3,1- 4,4 – scor mediu
≤4,5 – scor înalt

Identitate creativă

>3 - scor redus
Intre 3.1- 4,4 – scor mediu
≤4.5 – scor înalt

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Data about the author:
Mirela PANDELICA, PhD student, Doctoral School *of Humanities and Education Science*, Faculty of Psychology and Education Sciences, Sociology and Social Work, Moldova State University
E-mail: mirela.pandelica17@yahoo.com
ORCID: 0000-0001-9122-0188

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