# Serbian Translation of the 20-Item Toronto Alexithymia Scale: Psychometric Properties and the New Methodological Approach in Translating Scales

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## SUMMARY

**Introduction** Since inception of the alexithymia construct in 1970's, there has been a continuous effort to improve both its theoretical postulates and the clinical utility through development, standardization and validation of assessment scales.
**Objective** The aim of this study was to validate the Serbian translation of the 20-item Toronto Alexithymia Scale (TAS-20) and to propose a new method of translation of scales with a property of temporal stability.
**Methods** The scale was expertly translated by bilingual medical professionals and a linguist, and given to a sample of bilingual participants from the general population who completed both the English and the Serbian version of the scale one week apart.
**Results** The findings showed that the Serbian version of the TAS-20 had a good internal consistency reliability regarding total scale ($\alpha=0.86$), and acceptable reliability of the three factors ($\alpha=0.71-0.79$).
**Conclusion** The analysis confirmed the validity and consistency of the Serbian translation of the scale, with observed weakness of the factorial structure consistent with studies in other languages. The results also showed that the method of utilizing a self-control bilingual subject is a useful alternative to the back-translation method, particularly in cases of linguistically and structurally sensitive scales, or in cases where a larger sample is not available. This method, dubbed as 'forth-translation', could be used to translate psychometric scales measuring properties which have temporal stability over the period of at least several weeks.
**Keywords:** alexithymia; TAS-20; psychometric scale; translation methodology; back-translation

## INTRODUCTION

Since inception of the alexithymia construct in 1970's, there has been a continuous effort to improve both its theoretical postulates and the clinical utility through development, standardization and validation of assessment scales. Alexithymia itself represents a personality trait encompassing difficulty identifying and describing feelings, distinguishing between feelings and the related physical sensations, and an externally oriented cognition [1-5]. Over the time a number of alexithymia assessment tools have been devised, one such scale being particularly popular within the field of the psychosomatic medicine – a 20-item Toronto Alexithymia Scale (TAS-20) [6-11]. Consequently, this self-report scale has been translated into more than 20 different languages, crossing the cultural and language barriers and thus suggesting that the alexithymia is a universal trait [12-21].

The original English version of the TAS-20 has a simple factorial structure, streamlined and redefined from the earlier and larger 26-item scale: factor 1 assesses difficulty identifying feelings (DIF); factor 2 assesses difficulty describing feelings (DFF); factor 3 assesses externally oriented thinking (EOT). The later factor also indirectly assesses imagery deficits. Over the period of time, this factorial structure has been questioned and tested. Most of TAS translations confirmed the factorial utility, by large using a confirmatory factor analysis. The majority of the studies showed that factor EOT had low factor loadings, at or just below the internal consistency threshold [12, 22-29].

When translating a scale that has a complex linguistic and semantic structure, one encounters several problems. One is certainly determining a cross-cultural and cross-linguistic correlates within the frame of a context, extent and meaning. A commonly used method in translating scales into a different language is back-translation, where an item is translated back and forth until a (mostly linguistic) equivalence is reached. The problem with this method is that it usually undermines culture-specific semantic aspects. In other words, back-translation may ensure a linguistic correctness and yet fail to elicit a true meaning of a question.

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## OBJECTIVE

Considering a complex structure of the TAS, the main goal of our study was to achieve a pragmatic competence through a skilled trans-cultural translation, and, at the same time, to preserve a linguistic integrity at the highest level possible. The expectation was that the scores on the standardized TAS-20 and translated TAS-20-SRB would not statistically differ after being completed by the bilingual sample on two separate occasions, and that the scale's factorial structure would remain stable. The TAS was expertly translated into Serbian (a variant of Serbo-Croatian language), which is spoken by some 10 million speakers. This language belongs to the South-Slavic group of Indo-European languages, and the cultural milieu to that prevailing in Central- and South-East Europe. With minimal modification, the translation could be further used in other variants of the Serbo-Croatian.

## METHODS

As a general first step, TAS-20 was expertly translated from English to Serbian (Appendix I). The translation was done by two psychiatrists who both had experience working in an English and Serbian-speaking environment, and linguistically edited by a lector who majored in Serbian and in English literature. The study design then differed from the majority of TAS-20 translations published so far in that it did not use a back-translation method.

Instead, a non-clinical sample of 47 bilingual subjects fluent in both Serbian and English was recruited locally (age 18-60 years). The subjects were not previously treated psychiatrically and all volunteered to participate in the study (the attrition rate was at nil percent). The minimal level of education within the sample was "high school with some college", while the vast majority of the sample had university degree. The subjects were randomly assigned to complete either Serbian version (TAS-20-SRB) or English version (TAS-20) at week one, and, as a self-control, the version they did not previously complete at week two (7-14 days apart). Thus, an attribute of alexithymia that, as a personal trait, it has a temporal stability and changes little over time was utilized [5]. This was in order to prevent a bias that could be caused by an immediate retention and a short term memory. Such bias would produce a false correlation between the original scale and the translation in a situation when the subjects would not answer the questions, but rather remember the answers. In contrast to back-translation, the innovative method requires that the participants possessed a linguistic competence in both languages, here defined as competence pertaining to linguistic morphology, syntax and semantics, and that the answers would correspond between the original and translated TAS-20.

The reliability analysis of the Serbian version of the TAS-20 comprised the evaluation of internal consistency of both total score and scores on three Factors in terms of Cronbach Alpha (α). Sources of evidence for validity of the TAS-20-SRB were the factor analysis of the TAS-20-SRB

items as well as the factor analysis of summary scores on three TAS-20-SRB factors.

## RESULTS

Our findings showed that the Serbian version of the TAS-20 had a good internal consistency reliability regarding total scale (α=0.86), and acceptable reliability of the three Factors (α=0.71-0.79). Correlations of the TAS-20 and TAS-20-SRB total scores as well as scores on the TAS-20 and TAS-20-SRB Factors 1, 2 and 3 showed strong relationship regarding all respective scores. The factor analysis of all the items of the TAS-20-SRB in our sample could not replicate the original three factorial structure of the normative TAS-20 sample. Namely, factorial analysis of all the items here resulted in 6 main components accounting for 70% and 73% of variance in the English and Serbian version respectively. On the other hand, the factor analysis of both TAS-20 and TAS-20-SRB scores on Factors 1, 2 and 3 resulted in one main component which accounted for 70% and 68% of the variance.

A descriptive statistics presented in Table 1, and results of the paired-samples *t*-test procedure for comparing means of the English and Serbian version of the scale, show that there were no significant differences between the TAS-20 and TAS-20-SRB total and subtotal scores.

Our reliability analyses in terms of internal consistency showed that the Serbian version of the TAS-20 had good reliability regarding the total scale, and acceptable for group research reliability of the TAS-20-SRB Factors. The internal consistency coefficients are presented in Table 2.

Convergent validity analysis in terms of correlations of the TAS-20 and TAS-20-SRB total scores, and the TAS-20 and TAS-20-SRB Factor scores (i.e. TAS-20 Factor 1 vs. TAS-20-SRB Factor 1, etc.) showed strong relationship

**Table 1.** Descriptive statistics and t-test for the TAS-20 and TAS-20-SRB total and subtotal scores

| Variables | N | TAS-20 | | TAS-20-SRB | | t | p |
|---|---|---|---|---|---|---|---|
| | | Mean | SD | Mean | SD | | |
| Total scale | 47 | 37.74 | 11.44 | 36.94 | 11.20 | 1.57 | 0.12 |
| Factor 1 | 47 | 11.08 | 4.59 | 11.08 | 4.41 | 0.00 | 1.00 |
| Factor 2 | 47 | 9.81 | 4.00 | 9.57 | 3.70 | 1.50 | 0.14 |
| Factor 3 | 47 | 16.85 | 5.14 | 16.28 | 5.57 | 1.68 | 0.10 |

TAS-20 – Toronto Alexithymia Scale; TAS-20-SRB – Serbian translation of the TAS-20; N – number of subjects; Factor 1 – subscale related to difficulty identifying feelings; Factor 2 – subscale related to difficulty describing feelings; Factor 3 – subscale related to externally oriented thinking; SD – standard deviation; t – the value of the paired-samples t-test for testing the null hypothesis that two means are equal; p – two-tailed significance level

**Table 2.** Reliability statistics: Cronbach's alpha coefficients for the TAS-20 and TAS-20-SRB total and subtotal scores

| Variables | TAS-20 | TAS-20-SRB | Number of items |
|---|---|---|---|
| Total scale | 0.86 | 0.86 | 20 |
| Factor 1 | 0.80 | 0.79 | 7 |
| Factor 2 | 0.77 | 0.71 | 5 |
| Factor 3 | 0.68 | 0.74 | 8 |

Cronbach's alpha coefficient – measure of internal consistency reliability (for 47 subjects)

**Table 3.** Correlations of the TAS-20 and TAS-20-SRB total and subtotal scores

| Variables | N | r | p |
|---|---|---|---|
| Total scale | 47 | 0.94 | 0.00 |
| Factor 1 | 47 | 0.92 | 0.00 |
| Factor 2 | 47 | 0.95 | 0.00 |
| Factor 3 | 47 | 0.87 | 0.00 |

r – correlation coefficient; p – two-tailed significance level

**Table 4.** Construct validity of the TAS-20 and TAS-20-SRB – the factor analysis of the Factors 1, 2 and 3 where a single factor was extracted

| Variables | Factor loadings | |
|---|---|---|
| | TAS-20 | TAS-20-SRB |
| Factor 1 | 0.88 | 0.83 |
| Factor 2 | 0.90 | 0.88 |
| Factor 3 | 0.73 | 0.75 |
| Kaiser-Meyer-Olkin Measure of Sampling Adequacy[a] | 0.64 | 0.65 |
| Bartlett's Test of Sphericity[b] | 47.12 | 36.98 |
| Significance of b | 0.00 | 0.00 |
| The proportion of variance accounted for by the extracted factor[c] | 70.47% | 67.97% |

Factor loadings – standardised regression coefficients in the multiple regression equation with the original variable as the dependent variable and the factors as the independent variables
[a] tests whether the partial correlations among variables are small; [b] tests whether the correlation matrix is an identity matrix, which would indicate that the factor model is inappropriate; [c] based on the sums of squared loadings for the unrotated factor solution, which gives the variance accounted for by each factor/component)

among both total scale and Factor scores which is presented in Table 3.

A principal components factor analysis of all the items of the TAS-20-SRB in our sample could not replicate the original three factorial structure of the normative TAS-20 sample. Namely, factorial analysis of all the items here resulted in 6 factors or main components accounting for 70% and 73% of variance in English and Serbian version respectively.

The relationship between the scores on the three Factors in this study was also examined by principal components factor analysis and the results are presented in Table 4. The factor analysis here revealed a single dimension, or a single common factor underlying relationships among the three Factors, which accounted for 70% and 68%, in the TAS-20 and TAS-20-SRB respectively, of the variance observed in the variables that describe alexithymia, i.e. in the Factors 1, 2 and 3.

## DISCUSSION

The reliability analysis of the Serbian version of the TAS-20-SRB comprised the evaluation of internal consistency reliability of both total score and scores on the three factors in terms of Cronbach alpha (α).

In general, reliability refers to the consistency of test scores over repeated measurements. If a test is reliable, it means that respondents achieve the same score each time they are evaluated. Test developers and users most commonly rely on measures of internal consistency such as Cronbach's alpha. Coefficient alpha reflects item homogeneity, or the degree to which items are correlated. Reli-

abilities above 0.90 are considered excellent; good above 0.80, and reliabilities below 0.70 meaning that results can be used only for group research [30].

The validity is a general term referring to the scope and quality of evidence supporting the inferences, interpretations, classifications, decisions, or prediction made, all based on the test scores. Although evidence may be accumulated in many ways, validity always refers to the degree to which that evidence supports the inferences that are made from the scores. Construct validity is the most encompassing category of validity, and it refers to the extent to which a pattern of evidence exists supporting the interpretation of a test as a measure of some underlying attribute [31]. An important source of evidence is the pattern of correlations between the instrument and other measures of the same and other constructs. Ideally, the instrument should correlate strongly with other measures of the same construct (convergent validity) and should correlate weakly with measures of other constructs (discriminant validity). In addition to previously mentioned internal consistency of items which may be taken as evidence that the instrument is measuring a single construct, a source of evidence for construct validity in our study was factor analysis for revealing theoretically meaningful dimensions underlying test scores. The factor analysis is a statistical technique used to identify a relatively small number of underlying dimensions, or common factors, which can be used to represent complex phenomena, such as relationships among sets of many interrelated variables [32]. A number of variables can be used to describe a complex phenomenon. However, descriptions of what is meant by the term of alexithymia might be greatly simplified if it were possible to identify a small number of factors (or just a single factor as shown in Table 4), that could explain most of the variance observed in a larger number of manifest variables that describe alexithymia. So, the sources of evidence for construct validity of the TAS-20-SRB in our study included the analysis of convergent validity of all the TAS-20-SRB items with respect to the TAS-20, and factor analysis of the TAS-20-SRB items as well as summary scores on three TAS-20-SRB Factors. The analysis showed, beyond the favorable outcome in terms of the validity and consistency of the Serbian translation of the scale, that the method of utilizing a self-control bilingual subject could be useful alternative to the back-translation method, particularly in cases of linguistically and structurally sensitive scales, or in cases where a larger sample is not available. The authors are not aware if this method was utilized prior to this study, as it has not been as such reported in any of the major textbooks discussing the topic. The study also showed that the factor analysis confirmed factorial structure of the scale, also suggesting that the scale should be used only as a single instrument, particularly when utilized as a tool in research studies. The Serbian translation of the scale has satisfactory consistency and validity that permits for its routine use as a clinical tool. A detected relative weakness of the factor 3 is consistent with the findings reported in translations from other languages, which is also observed in the original (English) version and in specific population samples [12, 25, 28, 29].

**Appendix I.** Serbian translation of the 20-item Toronto Alexithymia Scale

| Tvrdnja | Nije tačno | Donekle netačno | Nisam siguran | Prilično tačno | Potpuno tačno |
|---|---|---|---|---|---|
| (1) Ponekad me iznenade emocije koje osećam. | 1 | 2 | 3 | 4 | 5 |
| (2) Teško mi je da pronađem prave reči da opišem kako se osećam. | 1 | 2 | 3 | 4 | 5 |
| (3) Imam fizičke probleme koje ni lekari ne mogu da objasne. | 1 | 2 | 3 | 4 | 5 |
| (4) Mogu lako da opišem to što osećam. | 1 | 2 | 3 | 4 | 5 |
| (5) Više volim da analiziram probleme nego da ih samo opišem. | 1 | 2 | 3 | 4 | 5 |
| (6) Kada se uznemirim, nije mi jasno da li se više osećam tužno, uplašeno ili ljutito. | 1 | 2 | 3 | 4 | 5 |
| (7) To što osećam u mom telu me često zbuni. | 1 | 2 | 3 | 4 | 5 |
| (8) Radije prepuštam da se stvari odvijaju same od sebe nego što pokušavam da shvatim razlog zašto se to dešava. | 1 | 2 | 3 | 4 | 5 |
| (9) Imam osećanja koja ne mogu tačno da prepoznam. | 1 | 2 | 3 | 4 | 5 |
| (10) Veoma je važno preispitivati svoje emocije. | 1 | 2 | 3 | 4 | 5 |
| (11) Teško mi je da opišem šta osećam prema drugim ljudima. | 1 | 2 | 3 | 4 | 5 |
| (12) Ljudi često traže da im jasnije opišem šta osećam. | 1 | 2 | 3 | 4 | 5 |
| (13) Ne znam tačno šta se to dešava u meni. | 1 | 2 | 3 | 4 | 5 |
| (14) Često ne znam zašto se naljutim. | 1 | 2 | 3 | 4 | 5 |
| (15) Radije razgovaram sa ljudima o njihovim dnevnim aktivnostima nego o njihovim osećanjima. | 1 | 2 | 3 | 4 | 5 |
| (16) Radije gledam lagane zabavne emisije nego psihološke drame. | 1 | 2 | 3 | 4 | 5 |
| (17) Teško mi je da iskažem moja najdublja osećanja čak i najbližim prijateljima. | 1 | 2 | 3 | 4 | 5 |
| (18) Mogu da osetim bliskost sa nekim čak i u trenucima kada ćutimo. | 1 | 2 | 3 | 4 | 5 |
| (19) Nalazim da je preispitivanje mojih osećanja korisno u rešavanju ličnih problema. | 1 | 2 | 3 | 4 | 5 |
| (20) Pronalaženje skrivenih poruka u filmovima ili dramama odvlači pažnju od uživanja u njima. | 1 | 2 | 3 | 4 | 5 |

The limitations of the study were noted, one of which is certainly a relatively small sample size primarily caused by the strict methodological limitation (only a fully bilingual subjects were enrolled), which prevented for an item-for-item comparison analysis. However, the sample size was sufficient for a competent three-factorial analysis. Secondly, the TAS scores of the sample fell at the low end of the range observed in comparable studies. At the same time, the goal of this study was to validate the translation of the scale rather than to measure the TAS score for any particular population, making the actual average scores of lesser importance. One could speculate that the reason for relatively low TAS scores in our sample, comparable to only one or two other previous translation studies, come from the subject selection method. This selection included healthy participants with higher-than-average education (including fluency in English and Serbian), higher social status and easier access to the health facilities, which all may contribute to lower scores. The last of the limitations is that we did not test alternate factorial structures of the TAS 20 scale, which we felt would fall beyond the scope of our study.

## CONCLUSION

Bilingual subjects showed temporally and quantitatively congruent scores on both TAS-20 and TAS-20-SRB, suggesting that the Serbian version of TAS-20 is a valid translation and reliable as a clinical tool for measuring alexithymia. The factor analysis of the scores on the TAS-20-SRB three factors resulting in one main component was indicative of a single underlying dimension related to the construct of alexithymia. The study also confirmed the validity of the new methodological approach in translating temporally stable and linguistically complex scales. We also propose that the new method could be referred to as a 'forth-translation', which serves as a simple descriptor that separates it from the back-translation method.

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# Српски превод Торонтске скале алекситимије са 20 питања – психометријске карактеристике и нови методолошки приступ у превођењу упитника

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**КРАТАК САДРЖАЈ**

**Увод** Од увођења конструкта алекситимије седамдесетих година двадесетог века стално се тежи да се побољшају теоријски постулати, као и клиничка примена кроз развој, стандардизацију и валидацију постојећих упитника.

**Циљ рада** Циљ рада је био да се оцени српски превод Торонтске скале алекситимије са 20 питања (енгл. *Twenty-Item Toronto Alexithymia Scale – TAS-20*) и предложи нова метода провођења упитника која би уважавала временску стабилност.

**Методе рада** *TAS-20* су превели билингвални медицински стручњаци и преводиоци за енглески језик, а потом су упитник попунили билингвални учесници из опште популације, који су енглеску и српску верзију упитника попуњавали са паузом од једне (две) недеље.

**Резултати** Истраживање је показало да српска верзија *TAS-20* има добру интерну поузданост у свеобухватној конзи-стенцији (α=0,86), као и прихватљиву поузданост три фактора (α=0,71–0,79).

**Закључак** Анализа је потврдила валидност и конзистент-ност српског превода упитника, с уоченим слабостима конзистентности факторске структуре код превода на друге језике. Резултати показују и да је метода укључивања у истраживање билингвалних учесника погодна алтернатива за повратни вид превођења, поготово код лингвистички и структурно осетљивих упитника, као и онда када није могуће применити истраживање на већем узорку испитаника. Ова метода, прелиминарно названа *forth-translation*, може се користити за превођење психометријских упитника којима се испитују особине које остају непромењене током најмање неколико недеља.

**Кључне речи:** алекситимија; *TAS-20*; психометријска скала; методологија превођења; *back-translation*