

## ORIGINAL RESEARCH

# Turkish Version of the Forms of Responding to Self-Critical Thoughts Scale (FoReST): A Reliability and Validity Analysis over Non-Clinical Samples

Mehmet Emrah Karadere<sup>1</sup> , Huseyin Sehidi Burhan<sup>2</sup> 

<sup>1</sup> Istanbul Medeniyet University, Faculty of Medicine Department of Psychiatry, Istanbul, Turkey

<sup>2</sup> Bakirkoy Training and Research Hospital for Psychiatry, Neurology and Neurosurgery, 5th Psychiatry Unit, Istanbul, Turkey

## Abstract

**Objective:** Forms of Responding to Self-Critical Thoughts Scale' (FoReST) is a self-evaluating scale that measures how flexible people respond to self-critical thoughts psychologically. This study aims to evaluate the reliability and validity of the Turkish version of FoReST over a non-clinical sample.

**Methods:** The study group consists of 109 university students. A demographic form, the Turkish version of FoReST, the Acceptance and Action Questionnaire (AAQ-2), the Self-Compassion Scale (SCS), the Rosenberg Self-Esteem Scale (RSE), and the General Health Questionnaire (GHQ-12) have been applied. Internal consistency, construct validity, convergent and concurrent validity, and temporal stability have been examined.

**Results:** The data from 109 participants indicate satisfactory reliability and validity of the Turkish version of FoReST. The Turkish version of FoReST shows good internal consistency with Cronbach's  $\alpha = 0.72$ . The test-retest analysis shows good temporal stability ( $r = 0.781$ ,  $p < 0.001$ ). Confirmatory factor analysis (CFA) shows the Turkish version to have a two-dimensional structure just like the original form and to indicate good fit. ( $\chi^2 = 37.84$ ,  $df = 25$ ,  $\chi^2 / df = 1.35$ ; RMSEA = 0.07; CFI = 0.95; TLI = 0.93; SRMR = 0.09). Pearson's correlation analysis for convergent and concurrent validity show correlations to exist among FoReST, AAQ-2, SCS, RSE, and GHQ-2 ( $p < 0.001$ ).

**Conclusion:** The Turkish version of FoReST is a valid and reliable scale for the Turkish speaking population. This scale can measure attitudes toward self-critical thoughts from the point of view of psychological flexibility.

**Keywords:** Self-Criticism, Acceptance and Commitment Therapy, Compassion Focused Therapy, Confirmatory Factor Analysis, Psychological Flexibility, Reliability And Validity

## INTRODUCTION

Self-criticism is when part of one's self devaluates and condemns one's behavior (1). Self-criticism can be considered a dysfunctional method a person uses to defend oneself against others' criticisms. In this way, one will probably avoid situations where they will be criticized by others (2). Self-criticism can be a type of avoidance behavior. It involves dysfunctional and repetitive thinking and thus can be defined as a form of rumination (3). Self-criticism is a critical component of psychopathology and is associated with different psychological problems such as depression, schizophrenia, eating disorders, and social anxiety (1,2,4).

Acceptance and Commitment Therapy (ACT), a relatively new therapy model and accepted as the pioneer of third-wave cognitive-behavioral therapies, deal with clinical problems through its novel psychological inflexibility model (5). According to this model, cognitive fusion and experiential avoidance are the main reasons for psychological psychopathology. Psychological inflexibility indicates a narrow behavioral repertoire that causes people to act inconsistently with their long-term goals (5,6). ACT evaluates self-criticism, which plays a role in various clinical problems, as a transdiagnostic process (7). From ACT's perspective, self-criticism is associated with cognitive fusion and avoidance, two fundamental elements of psychological inflexibility (8). Self-criticism is one of the main areas of interest in Acceptance and Commitment Therapy (9). Individuals may take to heart the content of self-criticizing thoughts and act according to these so-called facts. This can be considered as a kind of cognitive fusion.

**Corresponding Author:** Mehmet Emrah Karadere

Istanbul Medeniyet University Faculty of Medicine Department of Psychiatry, Istanbul, Turkey.

**E-mail:** karadere26@yahoo.com

**Citation:** Karadere ME, Burhan HS. Turkish Version of the Forms of Responding to Self-Critical Thoughts Scale (FoReST): A Reliability and Validity Analysis over Non-Clinical Samples. Psychiatry and Behavioral Sciences 2021; 11(1):57-62.

Doi: 10.5455/PBS.20210315025754

**Received:** Mar 15, 2021

**Accepted:** Mar 17, 2021

Self-compassion is about being kind and understanding toward oneself in difficult situations (i.e., experiencing pain or failure) rather than being self-critical (10). Individuals with high self-compassion may be open toward their problems and weaknesses and behave with kindness rather than being harsh toward themselves. Self-compassion can protect people against negative events and lead to positive feelings when life is not good (11). A negative correlation between self-criticism and self-esteem has been shown, and high self-esteem is linked to greater psychological well-being than low self-esteem (12,13).

Many authors have stated self-critical thoughts to be essential aspects of psychopathology, and some scales measure the presence of self-criticism (14,15). From ACT's perspective, however, the relationships among these thoughts are related to psychopathology rather than the presence of thoughts (1). Based on this point, White et al. (2020) developed the Forms of Responding to Self-Critical Thoughts Scale (FoReST) to measure individuals' relationships with critical thoughts (2). Namely, FoReST measures the how psychologically flexible people are in responding to self-critical thoughts. As far as is known, no measure has yet to be published in Turkish for measuring this relationship. Thus, we aim to examine the psychometric properties and factor structure of the Turkish version of Forms of Responding to Self-Critical Thoughts Scale (T-FoReST) over a non-clinical sample.

## METHODS

### Subjects

Approval from the local ethics committee has been made available (10.02.2020-4223). The sample consists of 109 undergraduate students attending Istanbul Medeniyet University. Announcement was made at the university and on social communication platforms of the students through student representatives. All students who agreed to participate in the study and completed the online study battery were included in the study. No exclusion criteria were applied. The convenience sampling method has been used.

### Measurement Tools

**Demographic Form.** The researchers developed this form for the current study, and it includes questions about participants' age, gender, and educational status.

**Turkish Version of FoReST.** The original scale was

developed by White et al. (2020) to measure how flexibly people respond to self-critical thoughts psychologically. It is a self-evaluating, 7-point Likert-type scale (1 = Never true, 7 = Always true) with nine items and a 2-factor structure (unworkable action, mindful acceptance). Higher scores for both factors represent a more inflexible response to self-critical thoughts (2).

**Acceptance and Action Questionnaire (AAQ-2).** The original scale was developed by Bond et al. (2011) to assess psychological inflexibility levels (16). Its Cronbach  $\alpha = 0.84$ . It is a self-evaluating, 7-point, Likert-type scale (1 = Never true, 7 = Always true) with seven items. Higher total scores indicate higher levels of experiential avoidance and psychological inflexibility. The Turkish adaptation of the scale was made by Yavuz et al. (2016) (17).

**Self-Compassion Scale (SCS).** This scale was developed by Neff (2003) to measure self-compassion (10). The scale has a 6-factor structure (self-kindness, self-judgment, common humanity, isolation, mindfulness, and over-identified). It is a self-evaluating, 5-point, Likert-type scale (1 = Never true, 5 = Always true) with 26 items. The adaptation studies of the Self-Awareness Scale into Turkish were carried out by Akın et al. (2007) (18).

**Rosenberg Self-esteem Scale (RSE).** The scale was developed by Rosenberg (1965) to measure people's sense of self-worth (19). It is a self-evaluating, 4-point, Likert-type scale with ten items. Higher scores obtained from the scale indicate lower self-esteem. The adaptation study to Turkish was done by Çuhadaroğlu (1986) (20).

**General Health Questionnaire (GHQ-12).** The original form was developed by Goldberg et al. (1997) (21). The 12-item self-evaluating scale aims to evaluate mental disorders in the community and non-psychiatric clinical settings. High scores indicate negative general psychological health. The adaptation study to Turkish was done by Kılıç et al. (1997) (22).

### Process

Permission was first obtained from the developers of the scale by e-mail. Later, three people proficient in English translated the original form into Turkish, and the researchers created one form by evaluating these translations. This form of the scale was presented to field experts who were asked to compare both the English and Turkish items of the scale in terms of content and meaning. After this stage, the necessary corrections were made in accordance with the experts' opinions, and the researchers composed the final version of the scale.

### Data Analysis

Jamovi (23) was used in the confirmatory factor analysis to test the construct validity of FoReST. Jamovi is a software program based on R (24) and uses R packages. For the statistical analysis of the scale, the Jamovi program used the *lavaan* (25), *semPlot* (26), and *psych* (27) packages. The validity of the models is able to be analyzed using the data's goodness of fit (28). A chi-square ( $\chi^2$ ) is responsive to sample size, the chi-square fit index is divided by the degrees of freedom ( $\chi^2 / df$ ), and the obtained relative chi-square is used to make  $\chi^2$  less dependent on sample size (29). The other fit indices used in the study include the comparative fit index (*CFI*; (30), Goodness of Fit Index (*GFI*), Normed Fit Index (*NFI*), and the Root Mean Square Error of Approximation (*RMSEA*; (31). The values *CFI*, *GFI*, and *NFI*  $> 0.900$ ;  $\chi^2 / df < 5$ ; and *RMSEA*  $< 0.0854$  can be considered as meeting the criteria for acceptable fit (32).

Cronbach's alpha of internal consistency, test-retest correlation for indicating temporal stability, and item-total correlation (ITC) have been used to test the scale's reliability. The correlations between the scales have been analyzed using Spearman's correlation method to examine convergent and concurrent validity.

### RESULTS

Ninety-four of the participants are female (86.2%); 20 (18.3%) of the participants are in their first year of university, 14 (12.8%) are in their second, 46 (42.2%) are in their third, 18 (16.5) are in their fourth, 4 (3.7%) are in their fifth, and 3 (2.8%) are in their sixth. Their ages range from 18 to 28 ( $M = 21.36$ ,  $SD = 1.78$ ).

The means, standard deviations, correlations, and t-values of the items from FoReST, as well as Cronbach's  $\alpha$  for the overall scale and each subscale are shown in Table 1.

**Table 1.** The means, standard deviations, correlations coefficients, t values, Cronbach  $\alpha$ , and If Item Deleted Cronbach  $\alpha$  values for FoReST

Factors	Items	Mean	Sd	CITC	t	Cronbach's $\alpha$	Cronbach $\alpha$
Unworkable Action	Item1	3.61	1.45	0.51	-10.820*	0.690	0.80
	Item2	3.61	1.50	0.74	-7.859*	0.663	
	Item4	3.49	1.51	0.60	-11.290*	0.678	
	Item5	3.61	1.63	0.61	-7.785*	0.663	
	Item7	3.83	1.57	0.58	4.346	0.677	
	Item9	3.57	1.60	0.36	-2.800*	0.720	
Mindful Acceptance	Item3	4.04	1.51	0.51	-4.231*	0.757	0.66
	Item6	4.23	1.58	0.61	-4.346*	0.724	
	Item8	3.90	1.48	0.31	-10.820*	0.703	

\* $p < .05$ , CITC: Corrected Item Total Correlation, Cronbach  $\alpha$  value of FoReST: 0.72

### Reliability Analyses

First, the internal consistency was checked to determine the reliability of the scale. The Cronbach alpha of internal consistency coefficient is 0.72 for the whole scale, 0.80 for the unworkable action subscale, and 0.66 for the mindful acceptance subscale. Next, the item-total correlations were evaluated. This method is based on calculating the correlation coefficient for each item with the total score of the scale. The sign of the correlation coefficient in any item being negative or having a value close to zero indicates the item to be far off from measuring the attitude that other items want to measure. Likewise, each item forming the scale must have a high relationship with one another. A high correlation of items with the total score from FoReST and with each other indicates their measurements to

be in the same direction. According to the CFA results (see Table 2), the item-total correlations for the whole scale range between 0.04 and 0.60. The item-total correlations for the sub-dimension of unworkable action ranges from 0.36 to 0.74, and for the sub-dimension of mindful acceptance sub-dimension between 0.31 and 0.61. The values for this analysis are given in Table 1.

Table 1.

Finally, the 23 participants who accepted the invitation for a retest filled the scale again after two weeks for testing the temporal validity. The test-retest Spearman correlation coefficients are 0.636 ( $p = 0.001$ ) for unworkable action, 0.635 ( $p = 0.001$ ) for mindful acceptance, and 0.781 ( $p < 0.001$ ) for the total score.

### Construct Validity

First, CFA was performed to determine the construct validity of the scale. The CFA results for the scale are shown in Table 2.

CFA confirmed the scale to have a two-factor structure (unworkable action and mindful acceptance; see Table

2). The fit indices for the analysis show good results ( $\chi^2 = 37.84$ ,  $df = 25$ ,  $\chi^2 / df = 1.35$ ;  $RMSEA = 0.07$ ;  $CFI = 0.95$ ;  $TLI = 0.93$ ;  $SRMR = 0.09$ ). All factor loadings are significant. The items with the highest factor loading values are Item 6 from the mindful acceptance sub-dimension and Item 2 from the unworkable action sub-dimension.

**Table 2.** The CFA results for FoReST

Factor	Items	Estimate	Standart Estimate	Standart Error	95% Confidence Interval		p
					Lower	Upper	
Unworkable Action	Item1	0.99	0.69	0.13	0.74	1,24	< .001
	Item2	1,39	0,93	0.13	1.63	1,63	< .001
	Item4	0.85	0.56	0.14	0.57	1,13	< .001
	Item5	0.95	0.58	0.15	0.64	1,25	< .001
	Item7	0.92	0.59	0.15	0.63	1,22	< .001
	Item9	0.61	0.38	0.16	0.30	0,92	< .001
Mindful Acceptance	Item3	0.93	0.62	0.20	0.53	1,33	< .001
	Item6	1,56	0,99	0.29	1.00	2,12	< .001
	Item8	0.52	0.35	0.16	0.20	0,83	.002

### Convergent and Concurrent Validities

For the convergent validity analysis, we have examined the correlations among FoReST, AAQ-2, and SCS. Pearson’s correlation shows statistically significant positive correlations for FoReST’s total score with AAQ-2 ( $r = 0.59$ ,  $p < 0.001$ ) and negative correlations for FoReST’s total score with SCS ( $r = -0.63$ ,  $p < 0.001$ ). For the concurrent validity analysis, we have examined the correlations among FoReST, RSE, and GHQ-12. Pearson’s correlation shows statistically significant positive correlations for FoReST’s total score with RSE ( $r = 0.61$ ,  $p < 0.001$ ) and GHQ-12 ( $r = 0.55$ ,  $p < 0.001$ ). Table 3 shows the results from Pearson’s correlation analysis for FoReST’s subscales with the other scales.

**Table 3.** Results of Pearson’s correlation analysis (r values)

	GHQ-12	AAQ-2	RSE	SCS
Unworkable Action	0.55***	0.56***	0.57***	-0.57***
Mindful Acceptance	0.18	0.26**	0.25**	-0.31**
FoReST Total score	0.55***	0.59***	0.61***	-0.63***

\* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$ . FoReST: Forms of Responding to Self-Critical Thoughts Scale GHQ-12: General Health Questionnaire AAQ-2: Acceptance and Action Questionnaire RSE: Rosenberg Self-esteem Scale SCS: Self-Compassion Scale

### DISCUSSION

This study has aimed to explore the psychometric properties and factorial structure of the Turkish Version of FoReST. We conducted several statistical analyses to examine internal consistency, construct validity, convergent and concurrent validity, and temporal stability of the scale.

To evaluate internal consistency, we looked at the Cronbach alpha coefficients, which were 0.72 for the whole scale, 0.80 for the unworkable action subscale, and 0.66 for the mindful acceptance subscale. The values from the original scale were 0.85, 0.86, and 0.82, respectively. Usually, the desired Cronbach’s alpha coefficient has a value greater than 0.7. Nevertheless, Cronbach’s alpha coefficient for the mindful acceptance subscale was relatively low. The low number of items may be related to why this Cronbach’s alpha value is less than 0.7. However, the results are acceptable due to the high item correlations (33). This result shows the internal consistency of FoReST to be sufficient.

Temporal validity was measured with the test-retest reliability analysis made two weeks after the initial application. Although reliability was found to be questionable in the subscales of unworkable action and mindful acceptance, the correlation coefficient for the scale’s total score was found to be acceptable with

a value of 0.781. Based on these results, the Turkish version of FoReST has sufficient temporal validity.

CFA was performed to determine the construct validity. CFA shows T-FoReST to have a two-dimensional structure just like the original form and the items to have a good fit. Also, all items are statistically significant.

Convergent validity refers to how closely the new scale is related to similar measures that are already available (34). The aim of developing T-FoReST is to measure how psychologically flexible people are in responding to self-critical thoughts. AAQ-2 is one method for measuring psychological flexibility that has been validated in many languages and different situations (17). People with high self-compassion can be more open to thoughts of self-criticism (35). The convergent validity analysis shows various levels of significant correlations among FoReST and its subscales with AAQ 2 and SCS.

Concurrent validity refers to the amount of consistency one novel measure has with other well-established measures (36). Our study has found various significant correlation levels for FoReST and its subscales with GHQ-12 and RSE apart from GHQ-12 with the subscale of mindful acceptance. Consistent with our findings, people who have dysfunctional relationships with their self-critical thoughts are expected to have rates of high anxiety and depression and low self-esteem (4,12,13). The subscales evaluate experiential avoidance (unworkable action) and acceptance (mindful acceptance), which are two basic elements of the psychological rigidity / flexibility model. Although these two basic elements are different, they are related to each other as in the result of this study (17).

The results of the present study show the construct validity, internal consistency, and convergent and concurrent validity of the Turkish Version of FoReST to be acceptable. Just like the original form, T-FoReST has a two-factor structure. As such, T-FoReST has good psychometric properties for measuring the relationship of critical thoughts and psychological flexibility in a Turkish-speaking sample.

At the point of self-critical thoughts, strong measure of psychological flexibility is the strength of the scale. However, it is not strong in evaluating psychopathology as its validity has not been evaluated in clinical populations in especially clinical disorders with high self-criticism. It may also be important to assess the quality and quantity of self-criticism, but this is not the main focus of the scale.

The study has some limitations. The critical limitations

are that the sample consists of non-clinical participants (i.e., it did not include clinical cases). The fact that mindful acceptance subscale is 0.82 in the original article and 0.66 in our results can be considered as a limitation. Also, it consists only of university students with a narrow age range, and the ratio of women to men was unbalanced. Future studies are needed over clinical samples for studying the relationships between this model and psychopathology.

## REFERENCES

- [1] Gilbert P, Clarke M, Hempel S, Miles J, Irons C. Criticizing and reassuring oneself: An exploration of forms, styles and reasons in female students Criticizing and reassuring oneself: An exploration of forms, styles and reasons in female students. *Br J Clin Psychol.* 2004;43:31–50. doi: 10.1348/014.466.504772812959
- [2] White RG, Larkin P, McCluskey J, Lloyd J, McLeod HJ. The development of the 'Forms of Responding to Self-Critical Thoughts Scale' (FoReST). *J Context Behav Sci.* 2020;15:20–29. doi: 10.1016/j.jcbs.2019.11.003
- [3] Bernstein EE, Heeren A, McNally RJ. Reexamining trait rumination as a system of repetitive negative thoughts: A network analysis. *J Behav Ther Exp Psychiatry.* 2019;63:21–7. doi: 10.1016/j.jbtep.2018.12.005
- [4] Werner AM, Tibubos AN, Rohrmann S, Reiss N. The clinical trait self-criticism and its relation to psychopathology: A systematic review-Update. *J Affect Disord.* 2019;246:530–547. doi: 10.1016/j.jad.2018.12.069
- [5] Hayes SC, Luoma JB, Bond FW, Masuda A, Lillis J. Acceptance and commitment therapy: Model, processes and outcomes. *Behav Res Ther.* 2006;44(1):1–25. doi: 10.1016/j.brat.2005.06.006
- [6] Yavuz F. Kabul ve Kararlılık Terapisi (ACT) Genel bir bakış. Acceptance and Commitment Therapy (ACT): An overview. *Turkiye Klin J Psychiatry.* 2015 May 7;8(2):21–27. (Turkish)
- [7] Luoma JB, Kohlenberg BS, Hayes SC, Bunting K, Rye AK. Reducing self-stigma in substance abuse through acceptance and commitment therapy: Model, manual development, and pilot outcomes. *Addict Res Theory.* 2008;16(2):149–165. doi: 10.1080/160.663.50701850295
- [8] Yadavaia JE, Hayes SC, Vilardaga R. Using acceptance and commitment therapy to increase self-compassion: A randomized controlled trial. *J Context Behav Sci.* 2014;3(4):248–257. doi: 10.1016/j.jcbs.2014.09.002
- [9] Luoma JB, Platt MG. Shame, self-criticism, self-stigma, and compassion in Acceptance and Commitment Therapy. *Curr Opin Psychol.* 2015;2:97–101. doi: 10.1016/j.copsyc.2014.12.016
- [10] Neff KD. The development and validation of a scale to measure self-compassion. *Self identity.* 2003;2(3):223–50. doi: 10.1080/152.988.60309027
- [11] Leary MR, Tate EB, Adams CE, Allen AB, Hancock J. Self-compassion and reactions to unpleasant self-relevant events: The implications of treating oneself kindly. *J Pers Soc Psychol.* 2007;92(5):887–904. doi: 10.1037/0022-3514.92.5.887
- [12] Trumpeter N, Watson PJ, O'Leary BJ. Factors within

- multidimensional perfectionism scales: Complexity of relationships with self-esteem, narcissism, self-control, and self-criticism. *Pers Individ Dif*. 2006;41(5):849–860. doi: <https://doi.org/10.1016/j.paid.2006.03.014>
- [13] Paradise AW, Kernis MH. Self-esteem and psychological well-being: Implications of fragile self-esteem. *J Soc Clin Psychol*. 2002;21(4):345–361. doi: [10.1521/jscp.21.4.345.22598](https://doi.org/10.1521/jscp.21.4.345.22598)
- [14] Baião R, Gilbert P, McEwan K, Carvalho S. Forms of self-criticising/attacking and self-reassuring scale: Psychometric properties and normative study. *Psychol Psychother Theory Res Pract*. 2015;88(4):438–452. doi: [10.1111/papt.12049](https://doi.org/10.1111/papt.12049)
- [15] Thompson R, Zuroff DC. The Levels of Self-Criticism Scale: comparative self-criticism and internalized self-criticism. *Pers Individ Dif*. 2004;36(2):419–430. doi: [10.1016/S0191-8869\(03\)00106-5](https://doi.org/10.1016/S0191-8869(03)00106-5)
- [16] Bond FW, Hayes SC, Baer RA, Carpenter KM, Guenole N, Orcutt HK, et al. Preliminary psychometric properties of the acceptance and action questionnaire-II: A revised measure of psychological inflexibility and experiential avoidance. *Behav Ther*. 2011;42(4):676–688. doi: [10.1016/j.beth.2011.03.007](https://doi.org/10.1016/j.beth.2011.03.007)
- [17] Yavuz F, Ulusoy S, Iskin M, Esen FB, Burhan HS, Karadere ME, et al. Turkish version of Acceptance and Action Questionnaire-II (AAQ-II): A reliability and validity analysis in clinical and non-clinical samples. *Klin Psikofarmakol Bülteni-Bulletin Clin Psychopharmacol*. 2016;26(4):397–408. doi: [10.5455/bcp.201.602.23124107](https://doi.org/10.5455/bcp.201.602.23124107)
- [18] Akın Ü, Akın A, Abacı R. Öz-duyarlık ölçeği: Geçerlik ve güvenirlik çalışması. Hacettepe Üniversitesi Eğitim Fakültesi Derg. 2007;33(33):1–10. (Turkish)
- [19] Rosenberg M. *Society and the Adolescent Self-Image*. Social Forces. Princeton, NJ: Princeton University Press; 1965. p. 16-36
- [20] Çuhadaroğlu F. *Adolesanlarda benlik saygısı*, Thesis. Hacettepe Üniversitesi; 1986 (Turkish).
- [21] Goldberg DP, Gater R, Sartorius N, Ustun TB, Piccinelli M, Gureje O, et al. The validity of two versions of the GHQ in the WHO study of mental illness in general health care. *Psychol Med*. 1997;27(1):191–197. doi: [10.1017/s003.329.1796004242](https://doi.org/10.1017/s003.329.1796004242)
- [22] Kılıç C, Rezaki M, Rezaki B, Kaplan I, Özgen G, Sagduyu A, et al. General Health Questionnaire (GHQ12 & GHQ28): Psychometric properties and factor structure of the scales in a Turkish primary care sample. *Soc Psychiatry Psychiatr Epidemiol*. 1997;32(6):327–31. doi: [10.1007/BF00805437](https://doi.org/10.1007/BF00805437)
- [23] The jamovi project. Jamovi. (Version 1.2). 2020. <https://www.jamovi.org>. [Computer Software].
- [24] R Core Team. R : A Language and environment for statistical computing. 2019. <https://www.r-project.org>. [Computer Software].
- [25] Rosseel Y. Lavaan: Latent variable analysis. 2018. <https://lavaan.ugent.be>. [R package].
- [26] Epskamp S, Stuber S. semPlot: Path diagrams and visual analysis of various SEM packages' output. R Packag version. 2017. <https://cran.r-project.org/package=semPlot>. [R package].
- [27] Revelle WR. psych: Procedures for psychological, psychometric, and personality research. 2019. <https://cran.r-project.org/package=psych>. [R package].
- [28] Brown TA. *Confirmatory factor analysis for applied research*. New York: Guilford publications; 2015. p. 35-138
- [29] Hoelter JW. The analysis of covariance structures: Goodness-of-fit indices. *Sociol Methods Res*. 1983;11(3):325–344. doi: [10.1177/004.912.4183011003003](https://doi.org/10.1177/004.912.4183011003003)
- [30] Bentler PM. Comparative fit indexes in structural models. *Psychol Bull*. 1990;107(2):238. doi: [10.1037/0033-2909.107.2.238](https://doi.org/10.1037/0033-2909.107.2.238).
- [31] Hu L, Bentler P. Evaluating Model Fit. In: *Structural Equation Modeling Concepts, Issues, and Applications*. Thousand Oaks CA : Sage Publications; 1995. p. 76–99.
- [32] Munro BH. *Statistical Methods for Health Care Research*. Vol. 1. Philadelphia: Lippincott Williams & Wilkins; 2005. p. 351-376
- [33] Pallant J. *SPSS Survival Manual*. 6th ed. New York, NY: Open University Press; 2016. p. 116-120
- [34] Krabbe P. The measurement of health and health status: concepts, methods and applications from a multidisciplinary perspective. Amsterdam: Academic Press; 2017. p. 113-150
- [35] Gilbert P. Introducing compassion-focused therapy. *Adv Psychiatr Treat*. 2009;15(3):199-208. doi: [10.1192/apt.bp.107.005264](https://doi.org/10.1192/apt.bp.107.005264)
- [36] Lin W-L, Yao G. Concurrent Validity. In: Michalos AC, editor. *Encyclopedia of Quality of Life and Well-Being Research*. Dordrecht: Springer Netherlands; 2014. p. 1184–1185.