Friendship Quality Scale: Adaptation and Psychometric Evidence

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Abstract

This article aims to adapt and gather evidence of validity and reliability of the Friendship Quality Scale (FQS) for the Brazilian context. To reach them, two studies were carried out. Study I sought to adapt and gather evidence of its construct validity. There was a non-probabilistic sample composed of 427 students from the cities of Parnaíba (47.1%) and Teresina (52.9%), with a mean age of 21.29 years (SD = 4.48). They answered the FQS and a sociodemographic questionnaire. The Factorial Exploratory Analysis was performed by Factor 10.4, which indicated a unifactory solution of the FQS, supporting the exclusion of an item from the security dimension and all those with make up the conflict dimension. A single factor structure consisting of 18 items, with factorial loads varying between 0.46 and 0.79, for 47% total variance and with an internal consistency of 0.93. Study II aimed to find new evidence about the unifactorial FQS. It counted on 401 students from the cities of João Pessoa (50.3%) and Cajazeiras (49.7%), selected for convenience. The mean age of participants was 20 years (SD = 4.83). These answered a notebook containing the same instruments applied previously. The Confirmatory Factor Analysis was performed in R software, which confirmed the one-factor model [χ^2 (135) = 215.53, p <0.001, χ^2 / gl = 1.59, CFI = 0.99, TLI = 0.99, RMR = 0.08, SRMR = 0.06, RMSEA = 0.04 (90% CI = 0.03-0.05)]. The presented Cronbach's alpha was 0.91. Finally, in order to resolve possible doubts about the structure, this model was compared with that proposed by the instrument's developers, gathering evidence that the one-factor model is statistically superior [χ^2 (85) = 119.72, p <0.01] to the five-factor. At the end of the research, he made available to the Brazilian context a measure to measure the quality of the friendship.

Keywords: quality of friendship; adaptation; validation

Introduction

Friendship can be understood as a type of interpersonal relationship, totally voluntary (Rubin et al., 1998), marked by bidirectional social interactions (reciprocity), for a long period of time (Kelley et al., 1983). This bond is perceived as important for those who cultivate it, having a significant impact on people's socio-emotional development (Rubin et al., 2009).Maintaining a good friendship bond has been shown to be a beneficial factor for physical and mental health (Uchino et al., 1999), in addition to showing positive relationships with well-being (Berndt et al., 1999; Walen & Lachman , 2000), and negative with depression (Bagwell et al., 2005; Nezlek et al., 1994) and anxiety (Tillfors et al., 2012), understanding this bond as healthy for the lives of those who establish it.

Thus, it appears that the Quality of Friendship is a factor that exerts a direct influence on the health of human beings, affecting the development and adjustment of individuals (Ladd et al., 996). This variable can be understood as the nature of interactions established between friends (Berndt & Perry, 1986), marked by a high level of positive characteristics, such as prosocial behavior, loyalty and intimacy (Thien & Razak, 2013), and low in negative attributes such as conflicts and rivalries (Berndt, 2002).In order to become aware of the instruments that measure this

construct, searches were carried out in the databases Periodicals CAPES, SCIELO and PsycINFO, with the combination of the descriptors "scale", "inventory" or "questionnaire" with "Quality of Friendship". The search words were put in Portuguese (Brazil) and English, in order to cover as many instruments as possible. The result of the survey pointed to the existence of six measures most used in the literature, namely: Network of Relationships Inventoryet al.,1985), Quality of Relationships Inventory (Pierceet al., 1991), Sport Friendship Quality Scale, Weiss & Smith, 1999, Friendship Quality Questionnaire; Parker & Asher, 1993; McGill Friendship Questionnaires (Mendelson & Aboud, 1999); and Friendship Qualities Scale (Friendship Quality Scale; Bukowskiet al.,1994).Among the options, the Friendship Quality Scale (EQA, Bukowski et al., 1994) was chosen. It evaluates the subjects' real perceptions about friendship relationships and not merely abstract concepts of this type of bond. In addition, it is parsimonious, that is, it contains the main aspects of Friendship Quality in a smaller number of descriptors. And finally, it exhibits satisfactory psychometric parameters in the context of origin. The Friendship Quality Scale was developed by Bukowski et al. (1994). This is composed of 23 items that reflect proximity, security, help,

companionship and conflict in the dyadic relationship. The Proximity dimension refers to the strength of the bond and feeling of affection that a person has towards another. This dimension is further subdivided into two: Affective Attachment, which concerns the feeling held by another, and Reflected Appraisal, which consists of feelings derived from interactions between peers and the formulated impression of how important the person is to their friend.The Security dimension is one of the most important properties of relationships. It is essential for the establishment of the bond the understanding that their friendships are safe and able to continue despite problems or conflicts, and that those chosen are trustworthy people (Coleman, 1974; Davies, 1984). This dimension is subdivided into two: Reliable Alliance, based on the belief that in times of need you can trust and count on your friends; and Transcendent Problems, reflects the belief that if there is any negative event in the course of the friendship (eg, fights), the relationship is strong enough to resist the problem. The Help dimension is understood as a factor of great importance in the friendship process. It is divided into two sub-dimensions: Support, characterized by mutual help and assistance when necessary; and Protection Against Victimization, refers to a friend's willingness to defend the other when the other is inconvenienced. The Company dimension is related to the search for opportunities to interact with the friend, understanding the moments they spend together as a fundamental or basic aspect of friendship. And finally, the Conflict dimension, characterized by fights and discussions, leading to the emergence of disagreements. This instrument has favorable internal consistency, with Cronbach's alphas ranging from 0.71 (Safety and Companionship) to 0.86 (Proximity).In view of this, the research aims to adapt and gather evidence of validity and reliability of the Friendship Quality Scale (Bukowskiet al.,1994) for the Brazilian context. To achieve the goal, two studies were carried out: in the first, adaptation processes and exploratory data analysis were described; and in the second, it focused on confirming the factorial structure pointed out by the previous research, in addition to comparing it with the pentafactorial model, found by its developers (Bukowski et al., 1994), aiming to arrive at the end of a structure that best fits adjustment to the Brazilian context.

Materials and methods

In the present research, two studies were carried out. Study I aimed to translate the Friendship Quality Scale (EQA) into the Brazilian context, simultaneously aiming to gather evidence of its construct validity (factorial structure and internal consistency). Study II sought to gather evidence of the structural adequacy of the EQA; in addition to comparing the unifactorial model with the five-factor model, suggested in the original version; aiming to arrive, in the end, at the most appropriate model for the national context.

Participants

Study I had a non-probabilistic sample, bringing together 427 undergraduate students from public universities in the cities of Parnaíba (47.1%) and Teresina (52.9%), with ages ranging from 18 to 50 years (M = 21, 59; SD = 4.48), the majority being female (61.4%), single (89.0%), Catholic (48.5%), with the feeling of belonging to the lower-middle social classes (42 .6%) and average (40.5%), and attending public institutions of higher education (89.7%). The courses that most contributed to the study were: Psychology (17.8%), Biology (14.1%), Pedagogy (8.9%) and Physiotherapy (7.0%).Study II had 401 undergraduate students from public (50.4%) and private (49.1%) institutions in the State of Paraíba [João Pessoa (50.3%) and Cajazeiras (49.7%)], selected for convenience (non-probabilistic sampling). The participants' mean age was 20 years (SD = 4.83; range 17 to 54). It is also noteworthy that the majority were female (65.4%), single (91.0%), Catholic (54.2%) and with a feeling of belonging to the middle class (59.9%). . The courses that most contributed to the study were: Psychology (46.6%), Mechanical Engineering (16.5%) and Chemical Engineering (11.3%).

Instruments

Participants in Studies I and II answered a response notebook containing the following **scales:**

Friendship Quality Scale (EQA): this instrument was constructed by Bukowski et al. (1994). It is composed of 23 items, organized into five dimensions, namely, proximity, security, help, companionship and conflict. Participants responded to the measure by informing the degree to which each of the items described or not their friendship relationship, using a five-point scale, with the following extremes: 1 (Does not describe my relationship at all) and 5 (Completely describes my relationship). The EQA presented in its original version Cronbach's alphas ranging from 0.71 (Safety and Companionship) to 0.86 (Proximity). Sociodemographic Questionnaire: questionnaire used with the aim of characterizing the sample, with regard to some variables (eg, age, sex, marital status, course, period attended and income).

Procedures

To ensure that the studies were within the limits established by the resolutions governing research with human beings, the project was submitted to the Research Ethics Committee of the Health Sciences Center – CEP/CCS/UFPB. And only after its approval (CAAE: 73315917.2.0000.5188), data collection and other procedures began. Seeking to make the research viable, the EQA first went through a thorough translation (English-Portuguese). For this, the backtranslation technique was used (Pasquali, 2010); which consists of translating the scale from English to Brazilian Portuguese, and then from this language to English. This procedure had the help of three proficient in both languages, aiming to ensure that this step was finished in an exquisite way. The instrument's vocabulary also underwent a subtle modification, seeking to fit the terms used by the target population of the study. For example, instead of using the word school, the word college was chosen, thus ensuring that the adaptation process was complete. Other precautions were taken, such as checking the intelligibility of the descriptors by the research population of interest (Semantic Analysis; Pasquali, 2006). For this, 20 university students collaborated, 10 of them in the first period and another 10 who were in the final stage of their course. After ensuring that the items were understood, people who fit the sample profile were contacted, asking them to respond to the instruments. In the collection, the voluntary nature and guarantee of anonymity of the identity and the answers given were informed, in addition to ensuring respect for Resolution 510/16 of the National Health Council, which regulates research with human beings in Brazil. The subjects answered the questionnaires only after signing the Informed Consent Form (TCLE). Participants took approximately 10 minutes to answer the questionnaire. The second study continued respecting all ethical precautions.

Data analysis

In the first study, the data were tabulated using the IBM SPSS software, version 21, which also helped to carry out descriptive analyses. The Factor 10.4 program (Ferrando & Lorenzo-Seva, 2016), in turn, was used to perform Exploratory Factor Analyzes (EFA), with the Unweighted Least Squares (ULS) extraction method, considering polychoric correlations and Normalized Varimax rotation. To help retain factors, the Hull method was used (Ceulemans & Kiers, 2006). The same program was used to verify the internal consistency of the measure, by calculating Cronbach's alpha coefficient. In the second study, the IBM SPSS software (version 21) was used for tabulation and descriptive analysis of the data was used. Subsequently, using the R software and the Lavaan statistical package (Rosseel, 2012), the final set of items was evaluated using a Confirmatory Factor Analysis (CFA) with the Weighted Least Squares Mean- and Variance-adjusted (WLSMV; Muthén et al., 1997). In order to verify the quality of fit of the EQA unifactorial model, the following fit indicators were taken into account:χ^2 (Chi-Square); χ^2/gl (Ratio between Chi-Square and Degrees of Freedom); Comparative Fit Index (CFI);

Tucker-Lewis Index (TLI); Standardized Root Mean Residual (SRMR) and Root Mean Square Error of Approximation (RMSEA). Values of the χ^2/gl ratio must be less than 5 or, preferably, 3; CFI and TLI must be above 0.90, or preferably 0.95 (Brown, 2015). RMSEA values must be less than 0.08, with a confidence interval not reaching 0.10 (Hair et al., 2009; Marôco, 2014).Finally, it is worth noting that reliability was assessed using Cronbach's alpha and Composite Reliability (CC). The first can range from 0 to 1, values above 0.70 being considered acceptable (George & Malley, 2002). The second was incorporated, due to its greater rigor when compared to the first; for its interpretation, values greater than 0.70 are accepted (Hair et al., 2009).

Results and discussions

Seeking to achieve the objectives outlined, at first, the adequacy of the data to the factor analysis was checked using the Kaiser-Meyer-Olkin (KMO) test and Bartlett's sphericity test. The first provided a value of 0.90, considered excellent (Hutcheson & Sofroniou, 1999). The second, in turn, presented the values $\chi^2(253) = 3,911.9$; $p < 0.001$, refuting the hypothesis that the covariance matrix is similar to an identity matrix and confirming the use of EFA in the collected data. The first EFA showed a factorial solution of five factors with eigenvalues > 1.0, which together explained 60% of the total variation. However, the Hull method (Ceulemans & Kiers, 2006), supported the retention of only one factor. Then, a new EFA was performed, fixing a single factor. This revealed that items 1, 7, 12, 16 and 23 had factor loadings below 0.30, that is, lower than the suggested cutoff point (Pasquali, 2010), thus opting for their exclusion. This decision led to the elimination of a dimension descriptor *Security* and all those who make up the Conflict dimension. Finally, a third EFA was performed in order to understand the resulting structure of the measure, as well as its factor loadings, commonalities and Cronbach's alpha. This information can be viewed in Table 1.

Items	Factor	h²
11. If my friend had to leave me, I would miss him/her.	0.79	0.63
15. If I have a problem at school or at home, I can talk to my friend about it.	0.79	0.59
04. I feel happy when I'm with my friend.	0.78	0.60
09. Sometimes my friend does things for me, or makes me feel special.	0.75	0.56
13. When I do a good job at something, my friend is happy for me.	0.74	0.54
08. My friend helps me when I'm having a problem with something.	0.73	0.53
18. If something is bothering me, I can tell my friend about it, even if it's something I can't tell other people.	0.72	0.52
19. My friend would stand up for me if someone else was causing me trouble.	0.72	0.51
21. If I forget my lunch or need some money, my friend would help me.	0.7	0.48
03. My friend would help me if I needed it.	0.69	0.47
06. If other people were bothering me, my friend would help me.	0.67	0.44
20. If my friend and I have a fight or argument, we can apologize and everything will be fine.	0.66	0.43
17. My friend thinks of fun things to do together.	0.63	0.39
10. If my friend and I do something that bothers each other, we can easily reconcile.	0.61	0.37
14. I think about my friend even when he/she is not around.	0.57	0.32
02. Sometimes my friend and I just sit and talk about academics, sports and things we like.	0.46	0.21
22. My friend and I spend all our free time together.	0.46	0.21
05. My friend and I go to each other's houses after school and on weekends.	0.38	0.14
Number of Items		18
Common Variance Explained (%)		47%
Cronbach's alphas		0.93
Own Value		8.42

Table 1: EQA Factorial Loadings and Commonalities Matrix

Table 1 displays a unifactorial structure composed of 18 items, with factor loadings ranging between 0.38 (Item 22: My friend and I spend all our free time together) and 0.79 (Item 11: If my friend had to leave me, I would miss him/her; and Item 15: If I have a problem at school or at home, I can talk to my friend (a) about that), explaining 47% of the total variance and with an internal consistency of 0.93. This indicator is considered excellent (Marôco, 2014).Based on the exploratory findings, we sought to

assess the quality of the adjustment of the EQA unifactorial model; assuming that the 18 items of the measure saturate in the same factor. However, aiming to provide the Brazilian context with a measure as a better internal structure, we sought to compare the unifactorial model, previously presented, with the pentafactorial one, found by its creators (Bukowski et al., 1994). For this, Confirmatory Factor Analyzes were performed with the WLSMV estimator, which is pointed out by Li (2014)

as responsible for yielding more accurate factor loading estimates when it comes to categorical data.

The unifactorial model presented the following indicators: χ^2 (135) = 160.44, p = 0.06, χ^2/gl = 1.18, CFI = 0.99, TLI = 0.99, SRMR = 0.05, RMSEA = 0.05(90% CI = 0.047 - 0.064). As for the regression weights,

they were statistically significant (t > 1.96; p < 0.05), ranging from 0.31 [Item 22. My friend and I spend all our free time together] to 0.72 [Item 13. When I do a good job at something, my friend is happy for me]. Cronbach's Alpha was 0.91 and CC was 0.92, the same being illustrated in Figure 1.
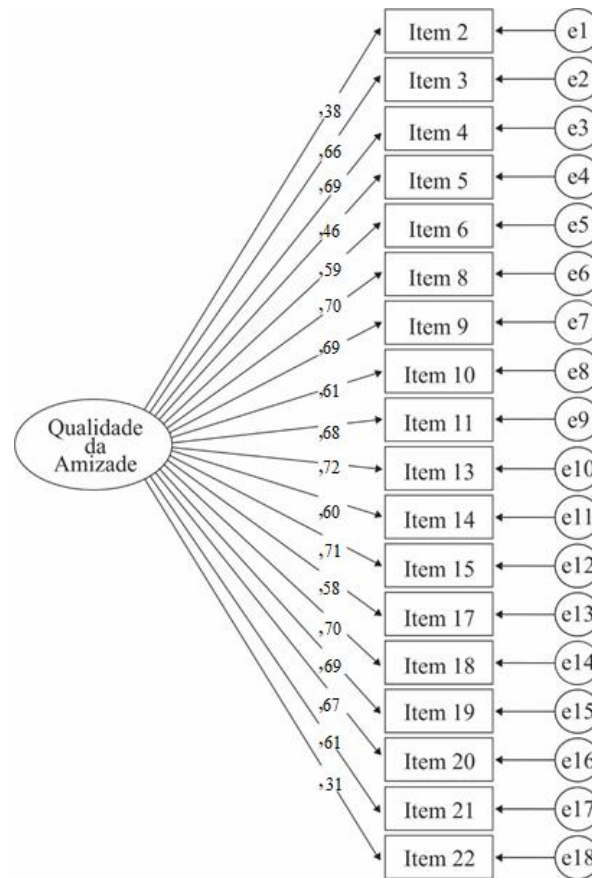

Figure 1: Factor Structure of the Friendship Quality Scale

The Pentafactorial model, in turn, exhibited the following adjustment indicators: χ^2 (220) = 321.58, p < 0.001, χ^2/gl = 1.46, CFI = 0.98, TLI = 0.98, SRMR = 0.05, RMSEA = 0.05(90% CI = 0.047 - 0.060). Factor loadings ranged from 0.05 [Item 23. My friend and I argue a lot] to 0.77 [Item 18. If something is bothering me, I can tell my friend friend about it, even if it's something I can't tell other people], being from the conflict and security dimension, respectively. It is also worth noting that most of the regression weights were statistically significant (t > 1.96; p < 0.05), except for Items 12 and 23, both in the conflict dimension. Cronbach's

alphas and the CC of each factor were: Companionship (α = 0.55; CC = 0.56), Conflict (α = 0.49; CC = 0.24), Help (α = 0.82; CC = 0.82), Security (α = 0.57; CC = 0.78), and Proximity (α = 0.83; CC = 0.83). However, the unifactorial model proved to be statistically superior [χ^2(85) = 119.72, p < 0.01].In order to gather additional evidence for such a conclusion, a correlation analysis (Pearson's r) was performed, aiming to gain knowledge of the existing relationships between the five dimensions of the EQA. The results can be viewed in Table 2.

	1	two	3	4	5
1					
2	0.19**				
3	0.54**	0.08			
4	0.53**	0.21**	0.64**		
	0.58**	0.13*	0.74**		
5				0.65**	

Note. *p < 0.05; **p < 0.001; 1. Companionship; 2. Conflict; 3. Help; 4. Security; 5. Proximity.

Table 2: Correlates between EQA factors

Table 2 shows that the Conflict factor presented positive and significant correlations with Companionship (r = 0.19; p < 0.001), Security (r = 0.21; p < 0.001) and Closeness (r = 0.13; p = 0.01), only. However, the other factors have high correlation coefficients (positive and significant) among themselves, which vary between 0.53 (Companionship, Safety) and 0.74 (Help and Proximity). Such results indicate, therefore, that the dimensions follow the same direction, except for the Conflict factor, which presents simple correlations with the others, when compared with the other coefficients, and non-significant correlations with the Help factor.

The process of adapting and validating the Friendship Quality Scale (EQA, Bukowski et al., 1994) to the Brazilian context involved two studies. The first focused on translating and gathering evidence of construct validity (factorial structure and internal consistency). It is believed that these objectives were achieved.

Exploratory factor analysis pointed to a unifactorial structure through Hull's criterion, which has shown a more satisfactory performance when compared to others (eg, scree plot; Parallel Analysis; Minimum Average Partial, Damásio, 2012). Aiming to achieve the best structure and adequacy of the scale, it was decided to exclude five items, one from the dimension *Security*(Item 7) and four of the dimension *Conflict*(Item 1, Item 12, Item 16, Item 23); thus eliminating all the items that make up this last factor. It is emphasizedthat the items of the conflict dimension were already presenting problems in adaptations carried out in other countries, such as Turkey, whose specialists opted for the exclusion of item 16 because it was not clear (Atik et al., 2014).It is believed that the non-saturation of the Conflict items in the general factor is due to the incompatibility with the theoretical definition of the Quality of Friendship construct, since this is understood as a pro-social behavior marked by high levels of positive characteristics(Thien & Razak, 2013), like intimacy and support (Berndt, 2002).The conflict could be discussed within the Quality of Friendship construct, if it were aimed at resolving this subversion, that is, after a misunderstanding, those involved in the friendship relationship would direct energies and efforts aimed at remedying the existing conflict and reestablishing the harmony of the bond (Parker & Asher, 1993). However, the items representing the Conflict dimension do not make this idea clear, as can be seen in Item 16, which is described as follows: I can fight with my friend. It makes clear the existence of a conflict, however, it does not announce commitments for its resolution. Therefore, the exclusion of all items from the Conflict dimension contributes to the validity of the instrument, supporting the measure to measure what it really proposes to measure (Pasquali, 2010). Other dimension items *Proximity*, Security, Help and Company had saturations above the recommended, contributing to a unifactorial configuration of the EQA. This structure is understandable due to the similarity of the theoretical conceptualization of each dimension, namely: Proximity, defined as an essential element for building and solidifying friendship (Bukowski & Hoza, 1989), as it refers to the feeling of intimacy, acceptance and attachment (Rutter, 1989); Security, an important property for maintaining bonds, which refers to the belief that a friend is reliable; Help refers to the assistance of material resources and emotional support when necessary; and the Company, refers to the time and activities shared by friends, indicating the level of closeness of a friendship (Bukowski & Hoza, 1989).Thus, it could be seen that all reported dimensions converged in a single direction, showing magnitude of factor loadings and explained variance as indicators of validity for the EQA. This shows that the structure found does not corroborate with that presented by Bukowski and Hoza (1989), who found a factorial organization composed of five dimensions. Despite this divergence, it is important to highlight that the findings are not at all surprising. This is because the dimensions proposed by these authors have the same direction and measure the same construct, which is the Quality of Friendship. In agreement with this, the general factor found, presentedinternal consistency above that recommended by the literature (0.91; Nunnaly,1991), even beingsuperior to the five-factor model found by Bukowski and Hoza (1989) in the EQA development study [Proximity (α = 0.77); Security (α = 0.71); Help (α = 0.73); Conflict

(α = 0.77); and Companhia (α = 0.71)], proving to be a much more reliable structure than the original one. The second study, in turn, aimed to gather evidence to support the structure of the EQA shown in the first study; in addition to comparing with the original structure (Bukowski et al., 1994), in order to resolve doubts about which model best fits the Brazilian context. It is believed that the goals have been reached, since the data allowed comparing the unifactorial and pentafactorial models; concluding, in the end, that the first is the one that presents the best adjustment indicators (Marôco, 2010), thus confirming the unidimensionality of the instrument found in Study I. The unifactorial structure, found here, presented superior adjustment indices, when compared to other studies that tested the adequacy of the pentafactorial model (Allès-Jardel et al., 2002; Ponti et al., 2010). To exemplify, the CFIs exposed by Allès-Jardel et al. (2002) and Ponti et al. (2010) were, respectively, 0.93 and 0.91, while the unidimensional structure reached a value of 0.99. The one-factor structure was also supported by the correlation analysis carried out between the original EQA dimensions, since there were significant relationships between Proximity, Security, Help and Company, these being the ones that form the unifactorial structure found here. As for the precision of the measure, composed of a single factor, it was possible to observe a Cronbach's alpha of 0.91 and a CC of 0.92, considered above acceptable levels in the literature (George & Malley, 2002; Hair et al., 2009;Zanon & Filho, 2015); even superior to thosefound by the original study (Bukowski et al., 1994), which showed alphas ranging from 0.71 (Companionship and Security) to 0.86 (Proximity), and those displayed by the versions: Turkish (Atik et al., 2014), with amplitude of 0.66 (Companionship) and 0.83 (Proximity); It isItalian (Ponti et al., 2010), with variability between 0.62 (Companionship) and 0.82 (Help).

Conclusions

In view of the findings and comparisons, it can be concluded that the study reached its end, reaching its initial objective, which is configured in the adaptation and validation of the EQA for the Brazilian context. However, like most studies, this one also has some limitations. For example, the influence of social desirability on reported data; and impossibility of generalization to the general population, due to the fact that the research used a convenience sample, not allowing to extend the results, not even to the group from which the sample was extracted. Another limitation concerns the use of a specific sample, since only university students from capitals and interiors of two Brazilian states were included. Finally, it should be noted that the divergences found in this study in relation to the suggested factorial structure do not detract from the findings, nor do they preclude the use of this measure for research purposes. On the contrary, the present study proposes a unidimensional measure with much better validity and precision indicators than those found in the original version. The implication of this is more impactful than the opposite statement, since unidimensionality favors one of the main purposes of psychometrics, which is parsimony, that is, giving as much explanation as possible with as little as possible.

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