

# Internal and External validity evidence for Level of Personality Functioning Scale – Brief Form 2.0.

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## Abstract

This study aimed was to investigate the internal and external evidence validity of LPFS-BF.2.0. 774 Brazilian adults, aged from 18 to 73 years, participated. The participants answered the following instruments: LPFS-BF.2.0., SAPAS, WHO-5, IDCP-SV, BFI-2 S. Data were analyzed using exploratory factor and factor congruence analysis, internal consistency, correlation with external measures, and mean comparison between groups. The internal structure found was similar to the one reported in previous studies. Results suggested validity evidence based on internal structure across adequate fit indices and factor congruence. This study's findings also provide validity evidence based on external relations. The LPFS-BF 2.0 presented negative correlations with well-being and positive correlations with other personality measures. Mean comparison revealed this test capacity for discriminating people with poor mental health from people with good mental health.

**Keywords:** personality disorders, pathological traits, psychometric.

## Resumo

*Evidências de validade interna e externa para a escala de nível de funcionamento da personalidade - forma resumida 2.0.* O objetivo deste estudo foi investigar as evidências de validade interna e externa para LPFS-BF.2.0. Participaram 774 brasileiros adultos, com idades entre 18 e 73 anos. Os participantes responderam aos seguintes instrumentos: LPFS-BF.2.0., SAPAS, WHO-5, IDCP-SV, BFI-2 S. Os dados foram analisados por meio de análise fatorial exploratória, congruência fatorial, consistência interna, correlação com medidas externas e comparação entre as médias dos grupos. A estrutura interna encontrada foi semelhante à relatada em estudos anteriores. Os resultados sugeriram evidências de validade com base na estrutura interna em índices de ajuste adequados e congruência de fatores. Os resultados deste estudo também fornecem evidências de validade com base nas relações externas. O LPFS-BF 2.0 apresentou correlações negativas com o bem-estar e correlações positivas com outras medidas de personalidade. A comparação de médias revelou a capacidade desse teste de discriminar pessoas com problemas relacionados a saúde mental e pessoas saudáveis.

**Palavras chave:** transtornos de personalidade, traços patológicos, psicometria.

## Resumen

*Evidencia de validez interna y externa para la escala de nivel de funcionamiento de la personalidad - formulario resumen 2.0.* El objetivo de este estudio es investigar las evidencias de validación interna y externa para LPFS-BF.2.0. Participaron 774 brasileños adultos, con edades entre 18 y 73 años. Los participantes respondieron a los siguientes instrumentos: LPFS-BF.2.0., SAPAS, WHO-5, IDCP-SV, BFI-2 S. Los datos se analizaron mediante análisis factorial exploratorio, congruencia factorial, consistencia interna, correlación con variables externas medidas y comparación entre las medias de los grupos. La estructura interna encontrada fue similar a la reportada en estudios previos. Los resultados sugieren evidencia de validación basada en la estructura interna sobre índices de ajuste apropiados y congruencia de factores. Los resultados de este estudio también proporcionan evidencia de validez basada en relaciones externas. El LPFS-BF 2.0 mostró correlaciones negativas con el bienestar y correlaciones positivas con otras medidas de personalidad. La comparación de medias reveló la capacidad de esta prueba para discriminar entre personas con problemas de salud mental y personas sanas.

**Palabras clave:** trastornos de la personalidad, características patológicas, psicometría.

Personality disorders (PD) have about 7% prevalence in the general Brazilian population (Santana et al., 2018). Studies performed in other countries indicate considerably higher prevalence rates in clinical samples, reaching 20% (Hayward & Moran, 2008; Links & Eynan 2013). PD is a severe form of mental illness that affects several areas of life. Negative outcomes like high suicidal behavior risk (Sher, Rutter, New, Siever, & Hazlett, 2019; Söderholm, Socada, Rosenström, Ekelund, & Isometsä, 2020) depression comorbidity (Gonçalves, Pimentel, & Carvalho, 2020), difficulty in the work environment (Carvalho, Martins, Gonçalves, & Sagradim, 2020; Kim et al., 2017) low levels of quality of life (Boye et al., 2008; Crempien et al., 2017) and well-being (Shafaei & Atashpour, 2019), and alcohol and drugs abuse (Gonçalves, Salvador, & Carvalho, 2021; Rosenström et al., 2018) are expected in PD patients. The first step to improving the PD patient's life and preventing more losses is becoming a diagnosis.

PD diagnosis can be based on different theoretical proposals, as the categorical and the dimensional models. Researchers have criticized the categorical model, officially used as the basis for diagnosing PD in diagnostic manuals such as the Diagnostic and Statistical Manual of Mental Disorders (DSM; Haslam, et al., 2012; Hopwood et al., 2020; Kotov et al., 2017). Categorical models assume that people with and without PD differentiates qualitatively; that is, they are assumed as members of different classes. Low reliability, diagnostic criteria were arbitrarily created, high rates of comorbidities between PD and other mental health problems, and symptomatic heterogeneity are some of the main problems regarding the categorical model (Widiger & Samuel, 2005). Another possibility to understand PD is the dimensional models. Dimensional models assume that people differentiate quantitatively, that is, they present the same traits, but they differ in levels, intensity. Although this model is not officially used in clinical diagnosis, several studies indicate that PD is better explained based on dimensional models (levels) than on categorical models (taxons; Krueger & Markon, 2014; Ofra et al., 2018; Spring, Letkiewicz, Carrillo, & Shankman 2021). However, defining when the level is pathological is critical for the dimensional model.

The DSM-5 (American Psychiatry Association [APA], 2013) consortium proposed an alternative model for personality disorder (AMPD) presented

in section III of the manual. The AMPD is a hybrid model, including categorical and dimensional aspects. Criterion A indicates whether people have (categorical) personality disorders, evaluating personal and interpersonal impairment. Criterion B (dimensional) assesses 25 maladaptive personality traits that compose a pathological profile (APA, 2013). A recent systematic review indicated broad support of the AMPD's clinical utility (Milinkovic & Tiliopoulos, 2020).

Tests for PD assessment were created based in AMPD proposal; for example, the Personality Inventory for DSM-5 (PID-5; Krueger, Derringer, Markon, Watson, & Skodol, 2012) and the Level Personality Functioning Scale Brief Form 2.0 (LPFS-BF.2.0.; Weekers, Hutsebaut, & Kamphuis, 2019). LPFS-BF.2.0 is a self-report scale to evaluate impairments in personality functioning as proposed in AMPD's criterion A. The LPFS-BF is a short version of the Level of Personality Functioning Scale-self report (LPFS-SR; Morey, 2017). This short scale comprises 12 items, each reflecting one of the 12 facets listed in AMPD's criterion A, including impairments in identity (experience of oneself as unique, stability of self-esteem and capacity for and ability to regulate a range of emotional experience), self-direction (pursuit of coherent and meaningful goals, constructive and prosocial internal standards of behavior and self-reflection), empathy (comprehension and appreciation of others' experiences and motivations, tolerance of differing perspectives and understanding the effects of one's behavior on others) and intimacy (depth and duration of connection with others, desire and capacity for closeness and mutuality of regard; Bach & Hutsebaut, 2018; Weekers et al., 2019).

Bach and Hutsebaut (2018) found preliminary validity evidence to LPFS-BF.2.0. Confirmatory factor analyses demonstrated adequate fit for a two-factor solution, interpretable as self-functioning and interpersonal functioning. The Cronbach's alpha values were  $\alpha = 0.79$  and  $\alpha = 0.71$  for the self-functioning and interpersonal functioning factors, respectively, and can be considered acceptable. In addition, the authors found expected correlations between the LPFS-BF 2.0 and external measures, as well as evidence of its discriminative capacity between patients with and without a borderline PD. Oliveira, Zimmermann, Krueger, and Hutsebaut, (in press) adapted the LPFS-BF.2.0 for use in Brazil.

There is scarce of tests to evaluate A criteria from DSM-5 in Brazil. Therefore, we aimed to investigate the

internal and external evidence validity of LPFS-BF.2.0. We created hypotheses for this study: h1) The internal structure would be similar a found in Weekers et al., (2019); h2) LPFS-BF.2.0 would be correlated positively with other personality measures (Bach & Hutsebaut, 2018;); h3) LPFS-BF.2.0 would be associated negatively with well-being (Shafaei & Atashpour, 2019; Weekers et al., 2019); h4) both factors would discriminate against people with and without mental health problems.

## Method

### Participants

Our study included 774 Brazilian adults aged from 18 to 73 years ( $M = 28.9$ ;  $SD = 11.58$ ), mostly female (80.7%), White (64.7%) and single (65%). Forty-one point five percent had completed high school, and 20.7 % had completed higher education. Regarding psychiatric history, 28.3% reported having some psychiatric diagnose. Table 1 presents details on the sample demographics.

**Table 1.** Sociodemographic information

Age	Mean(SD)	28.9(11.58)				
	Min-Max	18-73				
Sex		Female	Male			
	Raw %	625	149			
Scholar Degree		80.7	19.3			
	Raw %	Basic	High School	Graduate	Postgraduate	
Brazil's region		14	321	160	133	
	Raw %	1.8	41.5	20.7	17.2	
Ethnicity		South	Southwest	North	Northeast	Middle-west
	Raw %	163	504	34	37	36
Marital status		21.1	65.1	4.4	4.8	4.7
	Raw %	Caucasian	Brown	Black	Asian	Other
Psychiatry diagnoses		501	194	54	12	13
	Raw %	64.7	25.1	7.0	1.6	1.7
History Suicide Attempt		Single	Married	Divorced	Widowed	Other
	Raw %	503	211	32	6	22
Current suicidal thinking		65.0	27.3	4.1	.8	2.8
	Raw %	Yes	No			
Psychiatry diagnoses		219	774			
	Raw %	28.3	71.7			
History Suicide Attempt		Yes	No			
	Raw %	170	604			
Current suicidal thinking		22.0	78.0			
	Raw %	Yes	No			
		140	634			
		18.1	81.9			

### Instruments

*Level of Personality Functioning Scale – Brief Form 2.0 (LPFS-BF 2.0; Weekers et al., 2019).* The LPFS-BF 2.0 is a self-report scale for assessing impairments in the global personality pattern, as proposed in Criteria A of the Alternative Model for Personality Disorders presented in DSM-5 (APA, 2013). The LPFS-BF 2.0 consists of 12 items that should be answered on a four-point Likert scale and two factors impairment-related: Self and Interpersonal.

Evidence supports the psychometric properties of LPFS-BF 2.0 (Bach & Hutsebaut, 2018). The Brazilian version was adapted by Oliveira et al., (in press).

*Self-report Standardized Assessment of Personality-abbreviated Scale (SAPAS-SR; Moran et al., 2003).* The SAPAS-SR is a brief self-report to screening personality disorders composed of eight dichotomous items. Each item is scored 0 (absent) or 1 (present), and the sum of these scores generates an overall score, ranging from 0

to 8. Studies were realized with the SAPAS-SR and indicated good psychometric quality (Germans et al., 2008; Moran et al., 2003). In our sample, Cronbach's  $\alpha$  was .61.

*Five well-being index (WHO-5; Bech et al., 1996).*

WHO-5 is a self-report scale that captures emotional well-being and is developed from the World Health Organization-Ten Well-Being Index. It was conceptualized as a unidimensional measure that contains five positively worded items. The degree to which the positive feelings were present in the last two weeks is scored on a 6-point Likert scale ranging from 0 (not present) to 5 (constantly present). The raw scores are transformed to a score from 0 (worst thinkable well-being) to 100 (best thinkable well-being). The test showed good psychometric indicators (Topp, Østergaard, Søndergaard, & Bech, 2015) and internal consistency reliability  $\alpha$  .89.

*Dimensional Clinical Personality Inventory – Screening Version (IDCP-SV; Carvalho, Pianowski, & Reis, 2017).* The IDCP-SV was developed based on the full version of IDCP (Carvalho & Primi, 2015), a test for the measurement of pathological personality traits. The instrument consists of 15 items arranged in a 4-point Likert scale where 1 stands for “nothing to do with me” and 4, “everything to do with me.” Previous studies showed suitable psychometric properties of the IDCP-SV (Carvalho et al., 2017; Carvalho, 2017). In our sample, Cronbach's  $\alpha$  was .82.

*Big Five Inventory-2 Short (Soto & John, 2017).* The BFI-2-S is a self-report measure of personality traits based on the Five-Factors Model (FFM), evaluating extroversion, agreeableness, conscientiousness, neuroticism, and openness. This measure is composed of 30 items and must be answered on a 5-points Likert scale. A previous study showed adequate validity evidence to BFI-2-S (Rammstedt, Danner, Soto, & John, 2018; Soto & John, 2017). Therefore, we selected the Neuroticism factor for this study as it predicts personality disorders and general mental health problems (Brandes & Tackett, 2019; Kotov, Gamez, Schmidt, & Watson, 2010; Widiger & Oltmanns, 2017). In our sample, the Neuroticism Cronbach's  $\alpha$  was .80.

### Procedures

This study's procedures complied with the Declaration of Helsinki provisions regarding re-search on Human participants (World Medical Association, 2001) and was approved by the Ethics Committee of the São Francisco University. All participants signed an informed consent form before participating. Data collection was performed online via Google Forms. In addition, we shared the research link on the social media website (Facebook) and via WhatsApp, inviting individuals

to participate and engaging on the snowball strategy to reach a more substantial number of participants.

### Data Analysis

We conducted the analysis using Mplus version 7, the Statistical Package for the Social Sciences (SPSS) version 25, and R studio. To verify the LPFS-BF-2.0 internal structure, we performed an exploratory factor analysis (EFA) with maximum likelihood (ML) estimation and Geomin rotation. The factor structure quality was evaluated considering the following fit indices: Chi-square and degrees of freedom ratio ( $\chi^2/df < 2$ ), Confirmatory Fit Index (CFI;  $> .95$ ), Tucker-Lewis Index (TLI;  $> .95$ ), and Root Mean Square Error of Approximation (RMSEA;  $< .05$ ; Hu & Bentler, 1999). Important to note that the chi-square statistic is generally considered less useful for evaluating model fit as it is overly sensitive to sample size. We consider .30 as the cutoff point for factor loading. We conducted a congruence analysis using the items factor loading found in the EFA and the expected factor structure reported in Bach and Hutsebaut (2018). The factor congruence analysis was carried out using the psych package (Revelle, 2017). Values closer to 1 indicate the empirical factor loadings match the expected loadings defined theoretically. Cronbach's alpha verified the internal consistency reliability of the measures. We opted for the EFA for two reasons, first, considering the presence of crossloading previously observed in the LPFS literature, and second, to verify the structure of the LPFS in our sample.

We investigated Pearson's correlations between LPFS-BF-2.0 and external measures, and for the interpretation of the correlation coefficients ( $r$ ), we used the criteria of Cohen (1992):  $r \geq .10$  (weak),  $r \geq .30$  (moderate), and  $r \geq .50$  (strong). We used Pearson's correlation because this analysis verifies the relationship between two constructs allowing our comprehension of LPFS external validity evidence. We compared two groups in the LPSF-BF-2.0 factors. Group 1 consists of people who did not declare psychiatry diagnoses (negative group; 555) and group 2 people who reported psychiatry diagnoses (positive group; 219). We considered a significant difference when  $p < .05$ . The magnitude of the difference was also evaluated using d Cohen, considering values above 0.30.

## Results

First, we tested a two-factor structure for LPSF-BF-2.0 using EFA. The model fit indices were  $\chi^2/df = 3.2$ ; CFI = .967; TLI = .949; RMSEA = .05. Factor loadings, Cronbach's alpha and factor congruence are presented in Table 2.

**Table 2.** LPFS-BF 2.0 factor structure, reliability and congruence

	Self	Interpersonal
Item 1	<b>.68</b>	-.01
Item 2	<b>.81</b>	-.12
Item 3	<b>.67</b>	.09
Item 4	<b>.56</b>	.05
Item 5	<b>.81</b>	.00
Item 6	<b>.65</b>	.01
Item 7	.10	<b>.52</b>
Item 8	.00	<b>.53</b>
Item 9	-.03	<b>.69</b>
Item 10	.05	<b>.51</b>
Item 11	<b>.36</b>	.26
Item 12	.20	<b>.50</b>
$\alpha$	.85	.73
$\omega$	.85	.73
Congruence	.97	.96

Note. Loads >.30 in bold.

All the items loaded higher than .30 in the expected factor, excepted item 11, presented a higher loading in the self-functioning factor and did not reach the cutoff in the interpersonal-functioning factor. The congruence values were .97 and .96 to Self and Interpersonal functioning factors, respectively. The Cronbach's alpha and McDonald's omega values were adequate and bigger in Self than in Interpersonal functioning factor. Table 3 presents the correlation between LPFS-BF-2.0 and external measures.

**Table 3.** Correlation between LPFS-BF-2.0 and external measures

LPFS-BF-2.0	SAPAS	WHO-5	IDCP Screening	Neuroticism
Self	.55**	-.57**	.55**	.70**
Interpersonal	.49**	-.35**	.38**	.50**

Note. \*\* =  $p < .001$ .

Correlations with personality measures were all positive, significant, and with the magnitudes ranging from moderate to strong. Self-functioning factor had a stronger correlation than Interpersonal-functioning factor with external personality measures. Both LPFS-BF-2.0 factors negatively correlated with well-being measure, presenting a strong magnitude for Self and a moderate one for Interpersonal factor. Table 4 shows the mean comparison in LPFS-BF 2.0 factors between group 1 (people who do not report psychiatric diagnoses) and group 2 (people who report psychiatric diagnoses).

**Table 4.** Comparison between groups in LPFS-BF-2.0 factors

LPFS	Group	M (SD)	T	P	D
Self	Negative	2.29 (.81)	-5.635	<.01	.44
	Positive	2.65 (.78)			
Interpersonal	Negative	1.94 (.67)	-4.598	<.01	.36
	Positive	2.19 (.74)			

Note. M = Mean; SD = standard deviation; D = magnitude of difference.

The mean comparison results indicated significant differences between the groups in both factors, with the positive group having the highest means. The  $d$  effect size suggested a moderate difference the groups in both LPFS-BF-2.0 factors.

## Discussion

We aimed to investigate the internal and external evidence validity of LPFS-BF.2.0 Brazilian version. Overall, our results corroborated the hypotheses created for this study, supporting the use of LPFS-BF-2.0 for assess personality function in the Brazilian population. h1) the internal structure was similar a found in Bach and Hutsebaut (2018) with two correlation factors; h2) LPFS-BF.2.0 factors were negatively correlated with well-being; h3) LPFS-BF.2.0 factors were positive correlation with other personality measures; h4) both factors discriminated the groups.

Confirming our first hypothesis (h1), the EFA results indicated an internal structure similar to the structure reported in previous literature (Bach & Hutsebaut, 2018). We found a structure with two correlated factors, which content reflects Self and Interpersonal functioning impairments. The fit indices presented good values (Hu & Bentler, 1999). The congruence results were good between the expected item loading and the empirical loading, with results near 1, indicating a good congruence. The alfa values indicated a good internal consistency following Cohen's (1992) guidelines. Although these results corresponded to our expectations, it is important to note a difference between the factor structure found in the present study and the one described in Bach and Hutsebaut's paper (2018). The item 11 was expected to load in the Interpersonal-functioning factor; however, it loaded only in the Self-functioning factor. This result may represent a need to reformulate item 11. Nevertheless, it also can be understand given the item content ("I often feel very vulnerable when relations become more personal"), that seems to be connected both with Interpersonal (vulnerability in the context of more personal relations) and with Self related problems (the reason of the vulnerability may be the Self-related).

The correlations between LPFS-BF.2.0 and well-being were expected to be negative (h2). The results were similar to the appointed in the literature that indicated PD patients have a less general quality of life (Boye et al., 2008; Crempien et al., 2017; Gonçalves et al., 2020) and well-being (Shafaei & Atashpour, 2019). Conversely, the correlation between LPFS-BF.2.0 and other personality measures was positively conformable expected (h3). These results were in the same direction the fund by Bach and Hutsebaut (2018) indicated the tests could assess a similar construct. Our results showed a strong association between the LPFS-BF-2.0 with Neuroticism. The literature reports the Neuroticism is a robust mental health issues indicator, including personality disorders (Brandes & Tackett, 2019; Kotov et al., 2010; Widiger & Oltmanns, 2017). This association is good validity evidence that LPFS-BF-2.0 measures personality problems.

Mean comparison results also occurred as we anticipated, indicating that LPFS-BF 2.0 can discriminate people with and without mental health problems (h4). The positive group showed significant higher means when compared to the negative group demonstrating LPFS-BF.2.0 capacity to discriminate mental health issue people of the health people. This result is similar to other studies with different tests to measure personality impairment and the capacity to discriminate mental health problem people (Gonçalves et al., 2021; Rosenström et al., 2018).

Our results found in this study demonstrated consistent evidence of validity for LPFS-BF.2.0 based on the internal structure and the relationship with external variables. Besides, the results indicate that LPFS validity evidence contributes so that this instrument can be taken into professional practice with the test to screen personality impairment affecting people's lives. However, we need to consider some limitations of this study: 1) absence of clinical sample diagnosed with personality disorders that could bring more robust to results; 2) the sociodemographic characteristics of the participants were not very representative of the Brazilian population (predominantly women, single and with complete high school). Therefore, future studies need investigated social disability impact in LPFS-BF.2.0 internal structure and collect a clinical sample. Besides, verify test accuracy diagnoses.

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