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Psychometric properties of Brief Fear of Negative Evaluation – Comparison of BFNE and BFNE-S

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Abstract

Brief Fear of Negative Evaluation Scale (BFNE) is one of the most commonly used measures of social anxiety. Previous findings support the validity and reliability of BFNE. Present study examined the psychometric properties of the Slovak version of BFNE, respectively its abbreviated version BFNE-S. Scale was administered to a sample of 322 undergraduate college students. Confirmatory factor analysis (CFA) supports two factor model (positive vs. negative scored items). Internal consistency for both scales was excellent (α =.914, α =.929, respectively). Correlation between BFNE and BFNE-S was=.965. Based on the results of our analysis, we recommend using the abbreviated version (BFNE-S) which has comparable psychometric properties to BFNE, it is less time consuming, and without losing important information. Implications for future research are discussed.

Keywords:

Brief Fear of Negative Evaluation Scale, Reliability, Factor Structure, Social Anxiety

1 Introduction

Social phobia (respectively Social Anxiety Disorder) represents in both diagnostic systems (DSM 5 and ICD-10) an isolated nosologic category which belongs to anxiety disorders. Based on the results of the National Comorbidity Survey – Replication, estimated lifetime prevalence of the social phobia is 12.1%. Disorder is also strongly associated with psychiatric comorbidity and role impairment (Ruscio et al., 2008).

Expectancy of negative evaluation causes avoidance behavior in people with social phobia (respectively people with strong fear of negative evaluation). Typical strategy is to avoid situations of evaluation or situations with possibility of negative feedback. Fear of being evaluated by other people causes agitation and distress (Leary, 1983). Extremely strong anticipatory, inappropriate or unreasonable worries of being evalu-

ated by other people constitute the core cognitive aspect of social phobia (Bögels et al., 2010).

There are several questionnaire methods for assessment of social phobia (Mattick & Clarke, 1998). One of the most well known methods is The Fear of Negative Evaluation Scale. The questionnaire consists of 30 dichotomously scored items. Leary (1983) developed a brief version of the scale. Item format has changed to a five point Likert scale. Brief version has 12 items and excellent reliability (measured by Cronbach's alpha) (Rodebaugh et al., 2004).

At present, several versions of BFNE are available. All versions of the scale are reliable and also can discriminate clinical from non-clinical samples. Research findings support the two factor structure of BFNE. Scale is divided into reverse – and straightforwardly – worded items. The two factor solution seems to be a methodological problem. Factor does not represent separate aspects of fear of negative evaluation (Carleton et al., 2006; Rodebaugh et al., 2004; Weeks et al., 2005).

Several modified versions of BFNE are also available. Brief Fear of Negative Evaluation, Straightforward – BFNE-S (Rodebaugh et al., 2004; Weeks et al., 2005) consists of eight straightforwardly- worded items. Scales have exceptional internal consistency and good factorial and construct validity. Collins et al. (2005) modified 4 reversed-scored items to straightforward format. Scale has high internal consistency, test-retest reliability and also correlates significantly with depression and social avoidance. Results from the last large research on a large clinical sample suggest using the eight item version with only straightforwardly worded items (Carleton, Collimore, McCabe, & Antony, 2011) what is consistent with recommendation from previous researches (Rodebaugh et al., 2004; Weeks et al., 2005).

There are several adaptations of BFNE in non-English speaking countries (Koydemir & Demir, 2007; Pitarch, 2010; Tavoli, Melyani, Bakhtiari, Ghaedi, & Montazeri, 2009). The results support excellent reliability and construct validity. Measurement equivalence across cultures is still questionable (Wong & Moulds, 2014).

The primary purpose of the present study was a comparison of BFNE and BFNE-S. Aim of this comparison was to assess the plausibility of the abbreviated version. Psychometric properties and factor structure of scales were compared.

2 Method

2.1 Measures

Brief Fear of Negative Evaluation is the abbreviated version of Fear of Negative Evaluation (Watson & Friend, 1969). BFNE (Leary, 1983) consists of only 12 items. Each item is rated on a 5 – point Likert scale, ranging from *Not at all characteristic* (1) *of me* to *Extremely characteristic of me* (5). Scale has excellent internal consistency ($\alpha > .90$) and validity (Carleton, Collimore, McCabe, & Antony, 2011; Duke, Krishnan, Faith, & Storch, 2006). Psychometric properties of the Slovak version also suggest high internal consistency ($\alpha = .899$) and relationship with related constructs, such as trait anxiety and self-esteem in the expected direction (Hajdúk et al., 2014). Mean score for BFNE-S was calculated only from eight straightforwardly-worded items.

2.2 Participants

Three hundred and thirty-two undergraduate students of Comenius University and Pan-european University participated in the study (86 males and 246 females). Data consisted of participants from two previous researches. Cases with missing values were omitted from the present study. Age of participants ranged from 18 to 40 with M=21.17 and SD 2.33. Mean age for males was M=21.87 and SD=2.59 and for females M=20.93 and SD=2.19.

3 Results

3.1 Descriptive statistics

Mean score for BFNE was M=35.53 and SD=11.12. Mean for reverse-worded items was M=13.57 with SD=3.53 and for straightforwardly-worded items (BFNE-S) was M=21.95 with SD=8.72. Based on the results of the Shapiro-Wilk's test of normality, scores in the whole scale and also in subscales were not normally distributed. Gender differences were not significant (t(330)=-1.126, p=.261). Correlation between BFNE and scale consisting only of reverse-worded items was r=.764, p<.001. Correlation between BFNE and BFNE-S was r=.965, p<.001.

3.2 Reliability

BFNE demonstrated excellent internal consistency (α =.914*).* Guttman's lambda was λ =.93 and Omega total was ω =.93 (Revelle & Zinbarg, 2009). All used indices suggested excellent reliability of BFNE. Inter-item correlation matrix is in Table 1. Mean Item-total correlation was $r_{i\text{-}t}$=.653 and ranged from .314 to .781. Reverse-worded items showed smaller item-total correlations. For reverse scored items α =.719. Cronbach's alpha of BFNE-S was α =.929. Guttman's lambda was λ =.93 and Omega total was ω =.93. Mean Item-total correlation was $r_{i\text{-}t}$=.756 and ranged from .718 to .780.

3.3 Confirmatory factor analysis (CFA)

CFA analysis was performed using R package Lavaan (Rosseel, Oberski, & Byrnes, 2014). Weighted Least Square, Mean, and Variance (WLSMV) estimator was used for the estimation of parameters from the matrix of polychoric correlations. Weighted Least Square methods or their robust alternatives outperformed the Maximum Likelihood estimation method (Flora & Curran, 2004). We tested three models using CFA. Single factor model was compared to two factor model (Positive vs. Reverse scored items) and single factor model which consisted only of eight positive worded items. Each model was evaluated using the following fit indices: x^2, x^2/df, CFI (Comparative Fit Indices), TLI (Tucker – Lewis Indices), RMSEA (Root Mean Square Approximation) and SRMR (Standardized Root Mean Residual). Based on the recommendation

Table 1.
Inter – Item correlation matrix

	BFNE 1	BFNE 2	BFNE 3	BFNE 4	BFNE 5	BFNE 6	BFNE 7	BFNE 8	BFNE 9	BFNE 10	BFNE 11	BFNE 12
BFNE 1	-											
BFNE 2	.292	-										
BFNE 3	.639	.156	-									
BFNE 4	.545	.416	.458	-								
BFNE 5	.547	.181	.570	.409	-							
BFNE 6	.581	.168	.747	.423	.721	-						
BFNE 7	.525	.347	.322	.570	.372	.423	-					
BFNE 8	.594	.180	.629	.473	.595	.606	.400	-				
BFNE 9	.603	.157	.589	.499	.588	.572	.398	.768	-			
BFNE 10	.378	.242	.288	.361	.278	.322	.420	.278	.245	-		
BFNE 11	.718	.251	.632	.532	.577	.601	.452	.638	.604	.342	-	
BFNE 12	.628	.222	.604	.432	.558	.587	.348	.650	.616	.277	.615	-

Table 2.
Percentage of answers

Item	1	2	3	4	5
1	20.48%	21.99%	19.28%	23.49%	14.76%
2	23.20%	24.10%	22.90%	22.30%	7.50%
3	15.66%	25.60%	18.07%	26.51%	14.16%
4	17.20%	34.60%	25.00%	16.60%	6.60%
5	23.80%	24.10%	22.29%	21.69%	8.13%
6	27.41%	23.49%	19.58%	18.07%	11.45%
7	23.80%	29.80%	22.00%	18.10%	6.30%
8	26.51%	28.01%	18.67%	19.28%	7.53%
9	20.18%	33.13%	18.67%	19.28%	8.73%
10	19.90%	29.20%	27.40%	16.90%	6.60%
11	34.04%	18.98%	13.55%	18.37%	15.06%
12	15.96%	25.30%	19.88%	19.88%	18.98%

Percentages before recoding

(Hooper, Coughlan, & Mullen, 2008; Hu & Bentler, 1999): TLI>.95, CFI>95, RMSEA<.06, SRMR<.09. One factor model of BFNE has unsatisfactory model fit: $x^2(54) = 270.966$, $p<.001$, $x^2/df = 5.01$, CFI=.881, TLI=.855, RMSEA=.110, SRMR=.062. All estimates were significant. Two factor model shows better fit to the data: $x^2(54) = 150.385$, $p<.001$, $x^2/df = 2.78$, CFI=.947, TLI=.934, RMSEA=.075, SRMR=.042. Correlations between latent factors were r=.706. All estimates were significant. One dimensional model of BFNE-S has poorer fit to the data: $x^2(20) = 101.290$, $p<.001$, $x^2/df = 5.06$, CFI=.942, TLI=.918, RMSEA=.111, SRMR=.040.

Table 3.
Results of the CFA

	1 Factor solution			2 Factor solution		
	Standardized Estimate	SE	Z-value	Standardized Estimate	SE	Z
BFNE 1	0.813			0.817		
BFNE 2	0.314	0.064	5.580	0.407		
BFNE 3	0.782	**0.050**	**18.636**	**0.789**	**0.050**	**18.609**
BFNE 4	**0.641**	**0.048**	**13.903**	**0.836**	**0.302**	**6.192**
BFNE 5	0.733	0.055	15.347	0.740	0.055	15.349
BFNE 6	0.790	0.054	17.970	0.798	0.054	17.978
BFNE 7	**0.565**	**0.048**	**12.970**	**0.732**	**0.284**	**6.089**
BFNE 8	0.796	0.048	19.107	0.804	0.048	19.092
BFNE 9	0.773	0.049	17.594	0.781	0.050	17.599
BFNE 10	**0.422**	**0.056**	**7.926**	**0.532**	**0.222**	**5.482**
BFNE 11	0.811	0.051	21.438	0.817	0.051	21.317
BFNE 12	0.754	0.052	17.646	0.761	0.053	17.619

Reversed scored items are highlighted in bold.

4 Discussion

The purpose of the present study was comparison of BFNE and BFNE-S and their utility. Intent of this comparison was assessing the plausibility of the abbreviated version. Slovak version of BFNE has apparently excellent internal consistency. Reliability of reverse-worded subscale is substantially lower in comparison with the straightforwardly-worded subscale (BFNS-S) (.719 vs. .929). Findings of confirmatory factor analysis are highly consistent with previous researches (Rodebaugh et al., 2004; Weeks et al., 2005). Model with two correlated factors (positive vs. negative) has closest fit to the data. Internal consistency and mean item-total correlation of BFNE-S were higher in comparison to BFNE but results of CFA suggested unsatisfactory model fit. In general, results of our analysis support using BFNE-S considering internal consistency mean inter-item and item-total correlation. Omega coefficient was very high, which supports the claim about excellent

reliability of BFNE-S. Abbreviated version is also less time consuming, which is very important in situations when researchers use large batteries of questionnaires/tests.

Additional research is necessary to assess the test-retest reliability, and concurrent and discriminant validity of the scale. Present research addresses only reliability and factor structure of scale. Other very important directions of research will be assessing utility for detection of clinical changes during treatment. Results of preliminary psychometric analysis from the previous research supported construct validity (Hajdúk et al., 2014). Moreover, validation through psycho-physiological methods during public speaking could be an appropriate approach for examining validity of the scale.

Using modern test theory such as Item Response Theory (Hambleton, Swaminathan, & Rogers, 1991; Hays, Morales, & Reise, 2000) should also provide additional information about psychometric properties of BFNE-S. Relatively large sample sizes are required for this kind of analysis. Best solution could be the use of archival dataset, similarly as Rodebaugh et al. (2004).

Present study has several limitations. Sample consisted only of undergraduate students with predominance of women. In spite of the relatively large sample it is not possible to create standards for non-clinical population either. Demographic profile was similar for all participants. Using a community sample will provide important information about relationship of BFNE and important socio-demographic variables, such as partnership, highest finished education, socioeconomic status, etc. As we emphasized above, present study examined only limited aspects of psychometric properties and future research is necessary.

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