Revue européenne de psychologie appliquée 61 (2011) 147–151

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Original article

Cross-cultural validity of the Five Facets Mindfulness Questionnaire: Adaptation and validation in a French-speaking sample

Validité transculturelle du Five Facets Mindfulness Questionnaire : adaptation et validation auprès d'un échantillon francophone

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ARTICLE INFO

Article history:
Received 21 October 2010
Received in revised form 11 February 2011
Accepted 14 February 2011

Keywords:
Mindfulness
FFMQ
Validation
French-speaking sample
Self-report assessment
Confirmatory factor analysis

ABSTRACT

Introduction. – Recent research has revealed that mindfulness training improves mental health and psychological functioning. Although several questionnaires have been developed to measure mindfulness, the Five Facets Mindfulness Questionnaire (FFMQ), [Baer et al., 2006. Using self-report assessment methods to explore facets of mindfulness. Assessment, 13, 27–45] is currently one of the most empirically-based scale assessing mindfulness.
Objective. – The present study was designed to: (1) test the psychometric properties and (2) explore the structural validation of the French version of the FFMQ.
Method. – Two hundred and fourteen participants were tested using the French version of the FFMQ.
Results. – Using confirmatory factor analysis, the results showed the French version of the FFMQ has good psychometric properties and a structural validity similar to the initial version.
Conclusion. – This adaptation constituted a validated mindfulness measure for French-speaking clinicians as well as researchers.

Mots-clés :
Pleine conscience
FFMQ
Validation
Échantillon francophone
Questionnaire
Analyse factorielle confirmatoire

RÉSUMÉ

Des recherches récentes indiquent que l'apprentissage de la pleine conscience améliore la santé mentale et le fonctionnement psychologique. Unesérie de questionnaires a été développée en vue de mesurer ce construit. Parmi eux, le Five Facets Mindfulness Questionnaire (FFMQ) (Baer et al., 2006) est actuellement l'un des instruments empiriquement validés le plus utilisés pour mesurer la pleine conscience. La présente étude a alors été élaborée en vue : (1) de déterminer les propriétés psychométriques et (2) d'explorer la validité structurelle d'une adaptation francophone du FMQ. Deux cent quatorze participants ont complété l'adaptation francophone du FFMQ. Au moyen d'analyses factorielles confirmatoires, les résultats indiquent que la version francophone du FFMQ présente de bonnes propriétés psychométriques et une validité structurale similaire à la version initiale. La présente adaptation constitue ainsi une mesure valide d'évaluation de la pleine conscience utilisable tant pour le clinicien que le chercheur francophone.

Mindfulness training is a psychological intervention that trains participants to maintain their attention on their present experience, without judging or analytically processing it (Kabat-Zinn, 1982). Several studies have observed that mindfulness training improves cognitive processing (e.g., Heeren et al., 2009) and mental health (for a review see Grossman et al., 2004).

Until recently, however, methods for assessing mindfulness have received little empirical attention. Several questionnaires, however, have been proposed for assessing mindfulness skills. They include the Freiburg Mindfulness Inventory (FMI; Buchheld et al., 2001), the Mindful Attention Awareness Scale (MAAS; Brown & Ryan, 2003), the Kentucky Inventory of Mindfulness Skills (KIMS; Baer et al., 2004), the Cognitive and Affective Mindfulness Scale

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doi:10.1016/j.erap.2011.02.001

(CAMS; Feldman et al., 2004), the Mindfulness Questionnaire (MQ; Chadwick et al., 2005), the Toronto Mindfulness Questionnaire (TMQ; Lau et al., 2006), or the Philadelphia Mindfulness Scale (PHLMS, Cardaciotto et al., 2008).

As argued by Baer et al. (2008), although all of these self-report measures assess a general tendency to be mindful in daily life, showed potentially good psychometric properties, and are significantly correlated with each other, differences in their content and structural construct clearly indicate a lack of consensus about the conceptualization of mindfulness. For example, the MAAS and the CAMS are unidimensional instruments, supporting the notion that mindfulness consists of a singles factor. To the opposite, the KIMS and the PHLMS are multidimensional and suggest that mindfulness should be conceptualized as multifaceted construct. To overcome this limitation, Baer et al. (2006) integrated items from different questionnaires (i.e., FMI, KIMS, MAAS, MQ, CAMS) into structural factors, providing an empirical integration of previous independent attempts to operationalize mindfulness. This procedure resulted in a 39-item questionnaire, called the Five Facet Mindfulness Questionnaire, which contains items rated on a five-point scale ranging from 1 (*never or very rarely true*) to 5 (*very often or always true*). The resulting instrument is structured by five factors labeled: Observing, Describing, Acting with awareness, Nonjudgement of inner experience, and Nonreactivity to inner experience.

For each subscale, good internal consistencies, with alpha coefficients ranging from .75 to .91, were observed. The *Observing* factor includes items related to "attending to internal and external experiences, such as sensations, cognitions, emotions, sights, sounds, and smells". The *Describing* factor consists of items related to "labeling internal experiences with words". The *Acting with awareness* factor incorporates items referring to "attending to one's present activities, in contrast to the notion of automatic pilot (i.e., behaving automatically and mechanically while attention is focused elsewhere)". The *Nonjudgement of inner experience* factor is related to items referring to "the tendency to take a nonevaluative stance toward thoughts and feelings". Finally, the *Nonreactivity to inner experience* factor consists of items related to the tendency to "allow thoughts and feelings to come and go, without getting caught up in, or carried away by them".

In a second nonmeditating sample, confirmatory factor analysis corroborated the five-factors solution. Further, hierarchical confirmatory factor analysis suggested that four of the facets are clear indicators of an overarching mindfulness construct. The observing facet did not fit this model. More recently, Baer et al. (2008) have reported that the lack of fit for the observing facet interacted with the type of sample used. Their confirmatory factor analysis, conducted on a sample of individuals who had already practiced mindfulness, clearly supported a model in which all five factors are indicators of an overarching mindfulness construct, while the observing factor did not fit among a nonmeditating sample.

However, such assessment appears as relevant for several reasons. First, although increased mindfulness scores in practicing mindfulness have been seen with other questionnaires (i.e., the MAAS and TMS), the FFMQ was the first questionnaire demonstrating that changes in minfulness effectively mediate the effects of mindfulness training on psychological health. Second, recent research in which the FFMQ was administrated suggest the global score and the facets are helpful in understanding, not only the changes that occur with the long-term practice of mindfulness, but how these are related to symptom reduction and improved psychological functioning.

To our knowledge, no French adaptation and validation of the FFMQ has been published. The present study was designed to translate and validate the FFMQ into French. Our particular interest was the question of whether the factor structure found by Baer et al. (2006) could be replicated in a nonmeditating French-speaking sample. Furthermore, we hypothesized that, as observed by Baer et al. (2006), a hierarchical confirmatory factor analysis should support that four of the factors would be clear indicators of an overarching mindfulness construct while the observing factor would be less related to this overarching mindfulness construct.

1. Overview

The scale was first translated into French. Next, the structural validity of the French version of the FFMQ was tested with confirmatory factor analyses. Subsequently, we assessed its incremental validity examining its relation with depression and anxiety. Finally, we examined the test-retest reliability of the French FFMQ.

2. French adaptation of the scale

We followed the steps for the transcultural validation of psychometric instruments detailed by Hambleton et al. (2004) for test adaptation. Items were first translated into French and then back-translated into English. Three fully bilingual experts translated the original English scale into French using a committee approach. The French version was then translated back into English and re-evaluated by two other bilingual experts. The first author supervised the whole translation/back-translation process. Experts were instructed to verify the conformity of the retranslated English version with the original version and the precision of the French items. Items with problematic back-translation were thoroughly discussed and appropriately amended. Most discrepancies were minor, involving the choice between two synonyms. Regarding the use of an appropriated format for the items, four participants were then instructed to comment on the overall presentation of the instrument and the precision of the items. No remarks were made. The French adaptation of the FFMQ is shown in Appendix I.

3. Structural validation

3.1. Method

3.1.1. Participants

Two hundred and fourteen French speaking volunteers (131 women), who had never practiced mindfulness or meditation training, were administered the French version of the FFMQ. They were recruited among the Université catholique de Louvain community (Belgium), the Université Lille Nord de France community (France), and the acquaintance of the authors. All participants had at least a secondary school degree and were predominantly university graduates. Their ages ranged from 18 to 81 years old ($M = 35.39$, $SD = 13.55$).

3.1.2. Measures and procedure

Participants filled in the questionnaires individually and in a quiet room, either at home or in a university laboratory. They were administered the French version of the FFMQ. They also completed the State-Trait Anxiety Inventory (STAI; Spielberger et al., 1983) and the Beck Depression Inventory-II (BDI-II; Beck et al., 1998), which assess the level of anxious and depressive symptoms, respectively.

3.2. Data analysis

Confirmatory factor analysis, using AMOS 16 software (Arbuckle, 2007) was used to test the factorial validity of the FFMQ. Before performing the analysis, we examined the skewness and kurtosis of the data of the measurement model. All parameters were between −1 and 1, indicating that the data are univariately normally distributed.

The standard method of estimation in structural equation modelling is maximum likelihood, which is based on an assumption of multivariate normality of the manifest variables. However, as noted by Byrne (2001), an error that is frequently made when performing confirmatory factor analysis is that the normality of the data does not take into account multivariately. In our case, multivariately kurtosis was high, with a Mardia's (1974) coefficient of 158.713, clearly indicating a lack of multivariate normality. The items of the FFMQ refer to a sample of emotional behaviors that can be present or absent with varying frequency. This makes non-normality and categorization problems likely (McDonald and Ho, 2002). Therefore, using standard normal theory estimators with these data could produce estimation problems.

There are various formulas to correct for the lack of multivariate normality when performing confirmatory factor analysis. For the present case, the most appropriate approach is to use an estimation method that makes no distributional assumptions, such as the unweighted least squares (ULS) estimation method. ULS is analogous to ordinary least squares in traditional regression. Indeed, ordinary least squares method minimizes the sum of squared errors and ULS minimizes the sum of squared values in the residual matrix (Browne, 1982).

As suggested by Browne (1982), due to the fact that the covariance matrix might not be as asymptotically distributed as chi-squared with the ULS method, chi-squared test and other fit indexes based on such statistics were not computable and, therefore, reported. Therefore, we used the following fit indexes to verify the tested models: (a) Goodness of fit Index (GFI), (b) Adjusted Goodness of Fit (AGFI), (c) Parsimony Goodness-of-Fit Index (PGFI), and (d) Parsimony Ratio (PRATIO). Unfortunately, incremental and residual fit indices cannot be used with the ULS method.

GFI is an absolute fit indexes developed by Jöreskog and Sörbom (1984) with a corresponding adjusted version, the AGFI, developed to incorporate a penalty function for the addition of free parameters in the model. The GFI is analogous to R-square and performs better than any other absolute fit index regarding the absolute fit of the data (Hoyle & Panter, 1995; Marsh et al., 1988). Both GFI and AGFI have values between 0 and 1, with 1 indicating a perfect fit. As suggested by Cole (1987), a value of .80 has usually been considered as a minimum for model acceptance.

PGFI (James et al., 1982) and PRATIO are parsimony-based fit measures. Absolute fit measures judge the fit of a model *per se* without reference to others models that could be relevant in the situation. Parsimony adjusted measures introduce a penalty for complicating the model by increasing the number of parameters in order to increase the fit. Usually parsimony fit indices are much lower than other normed fit measures. Values larger than .60 are generally considered satisfying (Blunch, 2008).

4. Results

4.1. Structural validity

The five models investigated by Baer et al. (2006, 2008) were tested in a confirmatory factor analysis: (a) a hierarchical model with the five facets as latent variables and mindfulness as a second-order factor (Model A), (b) a model only including the five facets as latent variables (Model B), (c) a model with one sole principal factor (Model C), (d) a hierarchical model with four facets (all without the observation facet) as latent variables and mindfulness as a second-order factor (Model D), and (e) a model only including the four facets as latent variables (Model E). We also tested a hierarchical model with the five facets of mindfulness as latent variables and mindfulness as second-order factors for four of the facets while the observing factor is not related to this overarching construct (Model F).

Table 1 displays the fit indices of the six models. With the exception of the Model C, the five other models have very good fit indices. These results suggest that the observing facet is differentially related to the second-order factor than the others facets. Similarly, as showed in Appendix II, the observing facet presented lower standardized factor loadings on the broad mindfulness construct than the others facets. Baer et al. (2006) have reported similar pattern of results among nonmeditators. Therefore, we abided by the theoretical framework to select the most adequate model. In this case, as developed in the introduction, the hierarchical model with five factors (Model A) should be preferred.

As showed in Appendix II, the standardized factor loadings of Model A were statistically significant ($p < .001$). Three items, however, showed loadings below .40 (i.e., item4, item 11, and item 36). Therefore, we also re-ran all analyses without these items. Results did not show any significant change. In order to be consistent with the initial scale, we did not exclude these items.

4.2. Descriptive statistics and internal consistency

Table 2 displays the descriptive statistics and internal validity indices of the French version of the FFMQ factors and global score. With a value of Cronbach's alpha higher than .75 for all factors (Nunally, 1978), the scale demonstrates good internal validity. The correlations between the first-order and second-order factors are displayed in Table 3.

4.3. Correlations between the FFMQ and other constructs

Table 3 displays the zero-order correlations between the dimensions of the FFMQ and the BDI-II as well as the STAI.

4.4. Test-retest reliability

The temporal stability of the scale was examined in an independent sample of 40 French-speaking volunteers (21 women) over an 8-week period. These individuals, who had never practiced mind-

Table 1
Fit index values for the different tested models.

Models	df	GFI	AGFI	PGFI	PRATIO
Model A	697	.89	.88	.80	.94
Model B	692	.91	.90	.81	.93
Model C	702	.72	.69	.65	.95
Model D	430	.94	.93	.82	.93
Model E	428	.94	.93	.81	.92
Model F	698	.88	.87	.79	.94

A: Hierarchical model with five factors and one second-order factor; B: model with five factors; C: model with one sole factor; D: Hierarchical model with four factors and one second-order factor; E: model with four factors; F: hierarchical model with five first-order factors, one second-order factor, and four of the first-order factors related to the second-order factor; df: degree of freedom; GFI: Goodness of Fit Index; AGFI: Adjusted Goodness of Fit; PGFI: Parsimony Goodness-of-Fit Index, PRATIO: Parsimony Ratio.

Table 2
Descriptive statistics and internal consistency of the French Version of Five Facets Mindfulness Questionnaire.

Dimensions	*M*	*SD*	Minimum	Maximum	α
Observation	24.43	5.78	10	38	.78
Description	25.81	6.44	8	40	.88
Acting with awareness	27.29	6.617	8	40	.89
Nonjudging	27.79	6.88	9	40	.89
Nonreactivity	18.79	4.47	7	32	.76
Mindfulness	124.11	18.37	60	177	.88

Table 3
Correlations between the first-order factors, the second-order factors, and other psychological constructs.

Dimensions	Observation	Description	Acting with awareness	Nonjudging	Nonreactivity	Mindfulness
Observation	–	.253**	.094	−.111	.277**	.454**
Description		–	.208	.236**	.271**	.661*
Acting with awareness			–	.362**	.245**	.649**
Nonjudging				–	.386**	.641**
Nonreactivity					–	.655**
STAI-Trait	−.042	−.250**	−.198**	−.297**	−.447**	−.425**
STAI-State	−.011	.159	.408**	−.452**	−.369*	−.482**
BDI-II	−.042	−.086	−.467**	−.281**	−.281**	−.335**

Correlations between the first-order factors, the second-order factors, and other psychological constructs.

* $p < .05$.

** $p < .01$.

fulness or meditation training, were aged between 18 to 74 years old ($M = 32.27$, $SD = 13.85$). All participants had at least a secondary school degree and were predominantly university graduates. Participants filled in the questionnaires individually in a quiet room, either at home or in a university laboratory. The test-retest reliability was assessed using correlation coefficients between Time 1 and Time 2. Good test-retest reliability were reported for the mindfulness score, $r\ (40) = .64$, $p < .001$, the Observation facet, $r\ (40) = .71$, $p < .001$, the Description facet, $r\ (40) = .73$, $p < .001$, the Acting with awareness facet, $r\ (40) = .72$, $p < .001$, the Nonjudging of inner experience facet, $r\ (40) = .41$, $p < .01$, and the Nonreactivity to inner experience facet, $r\ (40) = .64$, $p < .001$. These analyses suggested that the individual differences are stable over time.

5. Discussion

The aim of the present study was to translate and validate the FFMQ into French. Of particular interest was the question of whether the five-factor structure found by Baer et al. (2006) could be replicated in a nonmeditating French-speaking sample. Furthermore, we hypothesized that, as observed by Baer et al. (2006), a hierarchical confirmatory factor analysis should support that four of the factors would be found to be clear indicators of an overarching mindfulness construct, while the observing factor would be less related to this overarching mindfulness construct. The present data support the hierarchical model found by Baer et al. (2006) among nonmeditators sample.

In addition, the global scale and each subscale have a good internal validity. It should also be noted that the global scale as well as each subscale exhibits good test-retest reliability. These results suggest that the French version of the FFMQ may be employed either as a unidimensional scale, using a global score of mindfulness, or as a multidimensional scale, using the specific score of each subscale.

As predicted, we found that the observing facet does not fit as closely on the broad mindfulness construct than the others facets. Baer et al. (2008) have found similar results with the observing facet and reported that this effect interacted with the type of sample used. Indeed, confirmatory factor analysis, conducted on a sample of individuals who had already practiced mindfulness clearly support a five-factor solution which are indicators of an overarching mindfulness construct, while the observing factor did not fit among a nonmeditating sample. According to Baer et al. (2008), the notion of self-focused attention may shed light this pattern of results. Self-focused attention has been defined as awareness of internally generated stimuli such as sensations, cognitions, and emotions. Biased selective self-focused attention has been identified as a transdiagnostic process that may play a causal role in maintaining or exacerbating several forms of psychopathology (e.g., Harvey et al., 2004). Because meditation teaches unbiased observation of all stimuli, it may reduce maladaptive forms of selective self-attention. Thus, high scores on the observing facet in meditators may indicate a greater tendency to be better able to shift attention flexibly rather than becoming rigidly absorbed in any particular class of stimuli.

Regarding incremental validity, in general, significant negative correlations were observed between the FFMQ and measures of depression and anxiety. However, again, there were no significant correlation between the observation facet and these other constructs. As mentioned above, Baer et al. (2008) suggested that the tendency to be observant of internal and external stimuli was only observed as adaptive in meditators. For others, previous findings suggest that it was maladaptive or neutral. In addition, our data also suggest that the nonjudging and nonreactivity facets seem to play a particular function. Indeed, there were negatively correlated with each measure of anxiety and depressions. Consistently, previous findings have also observed that these facets completely mediated the significant relationship between meditations and psychological well-being (Baer et al., 2008). These differential relationships with others constructs support the relevance of measuring facets separately.

The present study suffers from several limitations. First, our sample only comprises nonmeditators. Future studies should assess the structural validity of the French version of the FFMQ, and especially the particular nature of the observation facet, among meditators. Second, we did not assess the concurrent validity. Future studies should examine the correlation between the French version of the FFMQ and the other validated measure of mindfulness (e.g., the MAAS). Third, the test-retest sample was relatively small, thereby limiting statistical power and increasing the likelihood of a Type II error. Future research with larger samples is clearly needed.

In conclusion, the French version of the FFMQ constituted a mindfulness measure for French-speaking clinicians as well as researchers. As mentioned before, such assessment might be relevant in examining whether individuals who practise mindfulness become more mindful over time, and whether these changes effectively mediate the effects of mindfulness training on mental health.

Disclosure of interest

The authors declare that they have no conflicts of interest concerning this article.

Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at doi:10.1016/j.erap.2011.02.001.

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