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Psychometric Properties of the Five Facet Mindfulness Questionnaire in an Argentine Sample

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Abstract

Mindfulness-based interventions have proliferated in both clinical and non-clinical contexts in recent years, as has scientific research investigating their effectiveness. To date, numerous questionnaires have been developed for measuring state and trait mindfulness; very few have been validated within non-English speaking populations. In this regard, this study examined the psychometric properties of the Five Facet Mindfulness Questionnaire for a Spanish-speaking sample from Argentina. Reliability, convergent, and discriminant validity scores were acceptable and in line with previous studies. Using CFA techniques, the results show a reduction in the scale to 22-items and suggest that the sub-scale of non-react is not a significant part of the overall self-reported mindfulness structure in an Argentine population with little meditation experience. Possible explanations and implications of these findings are discussed.

Introduction

Over the past 40 years, mindfulness, which is central to many Buddhist traditions, has increasingly been integrated into Western society. Much of its burgeoning popularity and rapid adaptation in the West can be attributed to the effectiveness of mindfulness in facilitating positive change, an aspiration that appears to be universal amongst those who seek and learn its techniques. For example, within health care, research has shown mindfulness to play a role in alleviating suffering for individuals with medical and psychological conditions (see Piet et al., 2012; Chiesa & Serretti, 2013; Khoury et al., 2013, for reviews). Outside of health care, mindfulness has been applied to enhance functioning for children and adults in the fields of education, business, and sport (Burke, 2010; Birrer, Röthlin, & Morgan, 2012; Hülsheger, Alberts, Feinholdt, & Lang, 2013).

Given the apparent utility of mindfulness, researchers are now beginning to expand their focus by exploring its value in different cultures. The majority of research to date has been conducted with English-speaking populations. However, these findings cannot be generalized to non-English speaking populations, in which mindfulness is now becoming of increasing interest. Future research is required which, as Erkut (2010) articulates, generates "horizontal collaboration" between researchers in different countries to help develop nuanced, well-validated instruments that measure the same construct while maintaining sensitivity to particular cultural contexts.

Perhaps the most cited definition of mindfulness is that of Kabat-Zinn (2003, p.145), which describes it as the "awareness that emerges through paying attention on purpose, in the present moment, and non-judgmentally to the unfolding of experience moment by moment"

(Kabat-Zinn, 2003, p.145). Using this definition, many theoretical models, questionnaires, scales, and inventories have been developed for the measurement of mindfulness, all of which have shown good validity and reliability (Park, Reilly, & Cross, 2013). Each of these instruments, while attempting to measure the overarching construct of mindfulness, varies subtly in their emphasis on two aspects: (a) the underlying assumption of whether mindfulness should be measured as a state or a trait, and (b) the focus on distinctive, essential elements of the mindfulness construct. About the first aspect, multiple inventories focus on mindfulness as a trait i.e., a difference between individuals in their propensity to exhibit mindfulness day to day. These measures include the Freiburg Mindfulness Inventory (FMI; Buchheld, Grossman, & Wallach, 2001), the Kentucky Inventory of Mindfulness Skills (KIMS; Baer, Smith, & Allen, 2004), the Cognitive and Affective Mindfulness Scale (CAMS; Feldman, Hayes, Kumar, Greeson, & Laurenceau, 2007) and the trait version of the Toronto Mindfulness Scale (TMS-T; Davis, Lau, & Cairns, 2009). Other instruments emphasize the state of mindfulness, an intra-person variation in mindfulness at a particular time. These measures include the state version of the Toronto Mindfulness Scale (TMS; Lau et al., 2006) and the state items of the Mindful Attention Awareness Scale (MAAS; Brown & Ryan, 2003). Mindfulness questionnaires also vary widely on the second aspect mentioned above: the underlying components of mindfulness. For example, The CAMS measures four sub-factors: attention, awareness, present-focus and acceptance; the TMS measures curiosity and decentering; the MAAS measures attention and awareness; and both the FMI and the KIMS measure mindfulness as a non-hierarchical construct.

As can be seen, a lack of consensus exists among researchers on a universal definition and structure for the construct of mindfulness. The Five Facet Mindfulness Questionnaire (FFMQ; Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006; Bohlmeijer, ten Klooster, Fledderus, Veehof, & Baer, 2011) was an instrument developed to overcome this conceptual discrepancy. Constructed from a combined item pool of the trait mindfulness measures of the FMI, CAMS, and KIMS, and the trait items of the MAAS, confirmatory and exploratory analyses reveal the FFMQ to have five underlying trait dimensions:

> (1) Observing, attending to, or noticing internal or external stimuli, such as sensations, emotions, cognitions, sights, sounds, and smells; (2) Describing, noting, or mentally labeling these stimuli with words; (3) Acting with Awareness, attending to one's current actions, as opposed to behaving automatically or absent-mindedly; (4) Non-judging of inner experience, refraining from evaluation of one's sensations, cognitions and emotions; and (5) Non-reactivity to inner experience, allowing thoughts and feelings to come and go, without getting caught up in them (Carmody & Baer, 2008, pp. 24).

Validation research for the FFMQ has shown good structural validity for the five facets when utilized in populations with some form of meditation experience, although the facet of observing has received only partial validation with several studies revealing a four-factor structure when used with novice populations (Baer et al., 2006; Lilja, Frodi-Lundgren, Hanse, Josefson, Lundh et al., 2011; Cebolla, Garcia, Soler, Guillen, Baños & Botella, 2012; How, Wong, Lo, Mak, & Ma, 2014; Schmidt & Vinet, 2015; Christopher, Neuser, Michael, & Baitmangalkar, 2012).

The multiple facets of the FFMQ have demonstrated good convergent and divergent validity with other instruments measuring elements of psychological health. For example, the facets of describe, acting with awareness, non-judging, and non-reacting have shown positive and significant correlations with measures of emotional intelligence, openness to experience, and self-compassion, (Baer et al., 2006; Bränström, Kvillemo, Brandberg, & Moskowitz, 2010;

Cebolla et al., 2012). Significant negative correlations have been demonstrated between the FFMQ and measures of alexithymia, absent-mindedness, experiential avoidance, thought suppression, stress, anxiety, and neuroticism (Baer et al., 2006, Carmody & Baer, 2008; Bränström et al., 2010).

Very recently the FFMQ has been translated and validated in several languages including Dutch (FFMQ-NL: de Bruin, Topper, Muskens, Bögels, & Kamphuis, 2012), Chinese (Deng, Liu, Rodriguez, & Xia, 2011), Swedish (Lilja et al, 2011) and French (Heeren, Douilliez, Peschard, Debrauwere, & Philippot, 2011), all of which have shown good preliminary validity. Only two known prior studies have been conducted translating and validating a version of the FFMQ in Spanish-speaking populations - two from Spain (Remor, 2006; Cebolla et al. 2012; Aguado et al., 2015), one from Chile (Schmidt & Vinet, 2015) and one from Colombia (Manotas, Segura, Eraso, Oggins, & McGovern, 2014). Results have shown structures with five dimensions, consistent with the original development of Baer et al. (2008). At this time, there is no empirical evidence that shows the psychometric properties of the FFMQ using clinical or nonclinical samples of Argentinean subjects. For these reasons, the purpose of this paper is to examine the psychometric properties of the FFMQ in a sample of non-clinical Argentinean subjects.

Method

Participants. Two hundred and eighty individuals who were participants in a Mindfulness Based Stress Reduction (MBSR) course (90 males, 190 females) in Buenos Aires, Argentina participated in the study. Mean age was 43 years, ranging from 22 to 74 years. Sixty-five participants had some limited exposure to meditation experience and 215 reported no prior experience. All participants were either native or advanced in Spanish.

Hypotheses. In line with the findings of FFMQ validation studies utilizing novice meditators (Cebolla et al., 2012; Baer et al., 2006; Lilja et al., 2011) we hypothesize that the four of the five factors (describing, acting with awareness, nonjudging, and non-reacting) would show structural validity within our sample. We also stated that the scale yields acceptable levels of reliability and that the four factors would reveal good concurrent and divergent validity, with a significant positive relationship between psychological well-being and a substantial negative correlation between stress, anxiety, and depression.

Measures and Procedures

Participants completed an online battery of five questionnaires at the onset of an 8-week MBSR course. This battery is outlined below.

FFMQ-Spanish. A Peruvian translation of the FFMQ was adopted (Mola-Gubbins, 2009). This version was first translated by a professional translator and linguist and then passed to three independent professionals working in academia for review. Like the English version, this version has 39-items covering all five facets (Baer et al., 2008): "observing, describing, acting with awareness, non-judging of inner experience and non-reactivity to inner experience" (pp. 329). Responses were
requested in a Likert-style format ranging from 1 (never or rarely true) to 5 (very
often or always true).

BIEPS-A. The Escala de Bienestar Psicológico (BIEPS; Casullo & Castro, 2000) is a well-being scale based on Ryff's Psychological Well-being Scale (1989). It consists of 13-items

with three response choices (Agree, Disagree, Neutral) for the dimensions of Self-Acceptance (defined as the extent to which a person likes or dislikes certain aspects of him/her selves), Environmental Mastery (the degree to which a person feels is in control of the environment and external situations), Autonomy (the degree by which a person believes that his/her life is not controlled by external variables), Positive Relations with Others (the extent to which an individual may establish mature and healthy bonds with others), and Purpose in Life (the extent to which a person feels that his/her life has meaning).

BDI-II. The Beck Depression Inventory Second Edition (Beck, Steer, & Brown, 1996) is a well-known 21-item multiple-choice self-report inventory assessing cognitive, affective, motivational, and somatic symptoms of depression. Each item's response was given on a 4-point scale, ranging from 0 (not at all) to 3 (severely, it bothered me a lot). Example items include, 'I feel my future is hopeless and will only get worse' (pessimism), and 'I am sad all the time' (sadness). Based on reliability (internal consistency = 0.89), convergent, divergent, and criterion validities, the Spanish adaptation of the BDI-II has been shown to be adequate for screening depression and for quantifying depressive symptoms (Sanz, García, Espinosa, Fortún, & Vázquez, 2005).

BAI. The Beck Anxiety Inventory (Beck & Steer, 1993) is a 21-item multiple choice self-report inventory assessing the severity of anxiety, with each item option ranging from 0 (not at all) to 3 (severely, it bothered me a lot). Example, items include numbness or tingling, unable to relax, fear of dying, and difficulty in breathing. Several psychometric studies have demonstrated the Spanish version of the BAI to be valid and reliable (Sanz & Navarro, 2003; Magan, Sanz, & Garcia, 2008).

PSS. The Perceived Stress Scale (Cohen, Kamarck, & Mermelstein, 1983) is a 14-item scale that assesses the extent to which life events and situations are appraised as unpredictable, uncontrollable, and overwhelming. An example is, "In the last month, how often have you felt that you were unable to control the important things in your life?" Higher responses on the 5 Likert-response scale indicate higher levels of perceived stress. The Spanish translation of the PSS was employed, which has been shown to have adequate reliability and validity in previous studies (Remor, 2006).

Results

Principal Components Analysis. In order to explore the factor structure of the original 39-item scale, the data were subjected to a Principal Components Analysis Factor (PCA) using varimax rotation to ensure the highest possible orthogonality between factors. Only items with a minimal loading of .50 and a difference of at least .20 between the highest and next highest factor loadings are included in the table (Meyers, Gamst, & Guarino, 2013). This analysis revealed a 4-factor solution, accounting for 58% of the variance. These four factors were: observe, describe, acting with awareness, and non-judging. The factor of non-reaction was not significant. Results of the factors and loadings for the final 22 items are shown in Table 1.

Table 1

Factor loadings for Principle Components Analysis (Varimax rotation)

	Factor Loadings			
Source of Item and Content	1	2	3	4
Factor 1: Non-judge				
Ffmq10R:	.787			
Ffmq25R:	.786			
Ffmq39R:	.746			
Ffmq17R:	.733			
Ffmq3R:	.704			
Ffmq14R:	.657			
Factor 2: Observe				
Ffmq15:		.774		
Ffmq20:		.761		
Ffmq26:		.707		
Ffmq31:		.702		
Ffmq6:		.691		
Ffmq1:		.622		
Factor 3: Acting with Awareness				
Ffmq13R:			.821	
Ffmq5R:			.812	
Ffmq8R:			.770	
Ffmq18R:			.635	
Ffmq28R:			.605	
Factor 4: Describe				
Ffmq27:				.784
Ffmq12R:				.757
Ffmq37:				.715
Ffmq32:				.703
Ffmq22R:				.583

Note. Items 2, 4, 7, 9, 11, 16R, 19, 21, 23R, 24, 29, 30R, 33, 34R, 35R, 36 and 38R were removed due to low loadings.

Confirmatory Factor Analysis. To further examine the measurement model derived from the PCA, with 22-items and four factors, the data were subjected to a Confirmatory Factor Analysis (CFA) using maximum likelihood (ML). AMOS 18.0 was utilized for this analysis. One factor loading for each unobserved variable was set to one to offset the fact that the measurement scales for each unobserved variable were indeterminate.

Three fit indices were used for examining the models: the Comparative Fit Index (CFI) and Normal Chi Square index (CMIN/df) as relative fit measures and root mean square error of approximation (RMSEA) as an index of the non-central X^2-distribution. CFI is considered of reasonable fit greater than .90 (Bentler & Bonnett, 1980). A value of less than 2.0 has been proposed for the CMIN/df (Byrne, 1989) and the recommended value for RMSEA is less than .05 (Steiger & Lind, 1980; Browne & Cudeck, 1993; Meyers et al., 2013). Figure 1 shows results

of the confirmatory factor analyses assessing the four-factor model. Overall, the hierarchical model of four factors revealed a satisfactory fit (CFI = .913, RMSEA = 0.063, CMIN/df = 2.092).

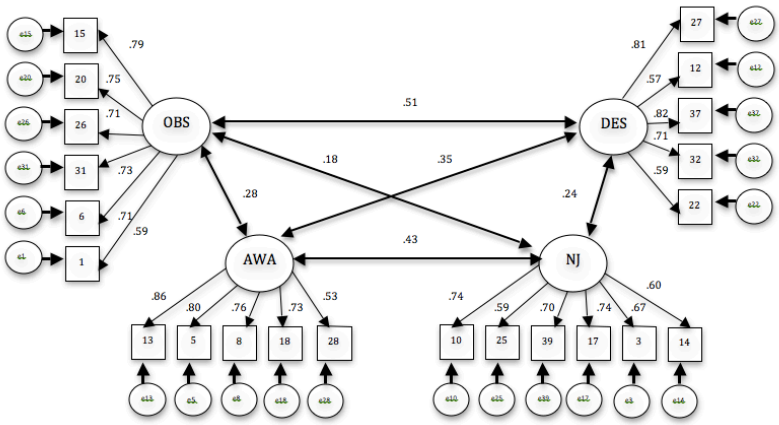

Figure 1. Model of four factors of mindfulness

Descriptive statistics and internal consistency. Table 2 presents descriptive statistics for the original five dimensions of the FFMQ. Internal validities for Spanish and English versions of the four FFMQ factors and the global score are shown in Table 3. Chronbach's alpha was used as a measure of internal consistency. Alpha scores between 0.70 and 0.90 reflect satisfactory to good internal consistency. In this sample, the FFMQ showed good internal consistency yielding an alpha score of 0.87 for the total scale and 0.8-0.86 for sub-scales. These findings are consistent with other versions of the FFMQ.

Table 2

Descriptive Statistics of the Argentine-Spanish version of the Five Facets Mindfulness Questionnaire

Dimensions	*M*	*SD*	Minimum	Maximum
Observe	3.20	.898	1	5
Describe	3.60	.827	1.40	5
Acting with Awareness	2.92	.905	1	5
Nonjudge	3.87	1.06	1	5
Mindfulness	10.57	2.20	5.13	16.40

Table 3

Cronbach's alpha coefficients in Spanish and English studies

Dimensions	*Present study*	*Mola-Gubbins study* (Peruvian)	*Cebolla study* (Spanish)	*Manotas study* (Colombian)	*Baer study (English)*
Observe	0.85	0.77	0.81	0.85	0.83
Describe	0.83	0.84	0.91	0.81	0.91
Acting with Awareness	0.86	0.86	0.89	0.83	0.87
Non-judge	0.83	0.86	0.91	0.86	0.87
Mindfulness	0.87	0.90	0.88	0.92	0.87

Note. For the current study, N = 278 and estimates are given for the 22-item scale.

Convergent and Divergent Validity. Convergent and divergent validities (Table 4) were calculated using Pearson's product-moment correlations between FFMQ and other measures of well-being and psychopathology. The sub-scales of the FFMQ correlated in the expected direction with the other variables in the battery. The depression scale (BDI) was negatively correlated with all facets of mindfulness and well-being (RYFF and BIEPS) were positively correlated with all FFMQ dimensions. On the perceived stress scale only acting with awareness and non-judgment were negatively correlated with stress. Anxiety (BAI) only correlated with subscales of describe, acting with awareness, and non-judgment.

Table 4

Correlations between four mindfulness factors and psychological constructs

Dimensions	Observe	Describe	Acting with Awareness	Nonjudge
Observe	-	.421**	.288**	.148*
Describe		-	.331**	.224**
Acting with Awareness			-	.390**
BAI	-.053	-.133*	-.279**	-.337**
BDI	-.212*	-.332**	-.396**	-.509**
RYFF	.236**	.365**	.333**	.444**
PSS	.041	.077	-.130*	-.138*
BIEPS	.192**	.295**	.371**	.371**

Note. BAI = Beck Anxiety Inventory; BDI = Beck Depression Inventory; RYFF = Psychological Well-Being Scale; PSS = Perceived Stress Scale; BIEPS = Psychological Well-being Scale (Bienestar Psicologico).
Note. Estimates are given for the 22-item scale. *p < .05, **p <.001.

Discussion

As pointed out by Erkut (2010), good psychometric characteristics of measures do not automatically translate from one culture to another. The purpose of the present study was to examine the psychometric properties of a Spanish-language version of the FFMQ within an Argentine sample.

In this study, reliability, convergent and divergent validity for this version of the FFMQ were acceptable and congruent with both the original questionnaire and other Spanish versions of the FFMQ (Baer et al., 2006; Cebolla et al., 2012). Structural equation modeling revealed four of the five facets (observe, describe, acting with awareness, and non-judgment) showed sufficient

fit with an Argentine sample and supported the conceptualization of mindfulness as a multi-faceted construct. Interestingly, and contrary to predictions, the facet of non-react was non-significant in the CFA model analyzes.

Reasons for this finding are not entirely clear although there could be several explanations. One possibility may be the impact of meditation experience on the clarity of the items as seen in previous studies (Baer et al., 2006; Lilja et al., 2011). Non-react, for example, may be understood differently in those individuals with meditation experience than people with no exposure to the techniques. For example, the non-react item "When I have distressing thoughts or images, I just notice them and let them go" reference is made to "letting go." To someone who has not experienced "letting go" through the meditative process, this may raise some confusion. In the pilot study conducted by Mola-Gubbins (2009), a difference was indeed found between meditators and non-meditators on the average for the non-react sub-scale.

Another possibility, as suggested by several researchers (Bishop et al., 2004; Baer et al., 2006), is that non-react is an outcome of mindfulness practice and need not be confused with the underlying elements of mindfulness. There has and continues to be much debate in this area, with no consensus to date as to what should be included in the definition of mindfulness. It is possible that non-reactivity, i.e., refraining from impulsive reaction to the experience, may come about only once an individual can attend to their experience with acceptance and non-judgment.

A point worth mentioning is that the original study validating the structure of the FFMQ drew items from five separate mindfulness questionnaires. Four of the final items came from the Kentucky Inventory of Mindfulness Skills (KIMS; Baer et al., 2004) which consisted of the factors: Observing, Describing, Acting with Awareness and Nonjudging of Experience and overlapped with several other questionnaires. Non-react was then added to form the fifth factor based on the idea that the component of reactivity was an integral but missing part of the mindfulness construct. Further validation studies are needed to examine its worthiness of inclusion in mindfulness questionnaires in greater detail.

Limitations and directions for future research

Several limitations need to be considered when interpreting the results of this study. First, our sample size was moderate and test-retest reliability was not assessed. Given the possibility that the factor structure may be sensitive to the level of experience of meditators, a larger sample with both mediators and non-mediators would allow a more nuanced analysis in this area. This is especially necessary on the facets of non-react and observe, which seem to vary in their fit across studies. Second, more studies are needed to replicate and elaborate on the validity of the FFMQ in the Argentine population. We also recommend that similar research is conducted in more countries within the Latin American region.

Conclusion

In summary, this study has demonstrated that the Five Facet Mindfulness Questionnaire (Peruvian Spanish version) may be a useful version for use in Argentina on four of the five facets: observe, acting with awareness, describe, and non-judgment. Non-react was not supported psychometrically as a sub-construct of mindfulness. As this is one of few known studies of the FFMQ within a Spanish-speaking population, more validation studies are strongly needed to confirm factor structure and ultimately ensure the most valid measure of utilization for future clinical and scientific purposes in these populations.

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The paper has six authors. Check http://scielo.isciii.es/pdf/ejpen/v26n2/original5.pdf for more information. Removed – Palacios from Garcia-Palacios

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Comment [A3]: Are these the last names or the first names? Also, needs proper punctuation and use of commas.

Christopher and Michael are family names. Check http://link.springer.com/article/10.1007/s12671-011-0086-x for more information.

Punctuation and use of commas, done.

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Comment [A4]: N

Comment [A5]: No first initials?

Done.

Comment [A6]: Revise for 7 plus author reference – see Lau above for correct example.

Done.

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