

Using Cognitive Interviews to Assess the Cultural Validity of State and Trait Measures of Mindfulness among Zen Buddhists

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Abstract Although Western psychological mindfulness shares many common features with Buddhist mindfulness, subtle differences in the way in which it is practiced and assessed may have important implications. Therefore, the primary goal of this qualitative study was to evaluate the cultural validity of the Five Facet Mindfulness Questionnaire (FFMQ) and Toronto Mindfulness Scale (TMS) by using cognitive interviews among a sample of Buddhist clergy and laypersons to assess their perceptions of these two scales. Participants were 14 Zen Buddhists (seven laypersons, six Zen priests, and one in priest the ordination process) recruited from a monastery in the Pacific Northwestern USA. Each participant completed a cognitive interview using the FFMQ and TMS. We developed a coding schema to identify and categorize participant responses and then applied the final coding framework to all 14 interviews. Results revealed perceived concerns and strengths of each scale, as well as concerns regarding content deemed missing from both scales and general issues related to mindfulness self-assessment. These findings suggest that Buddhist and Western psychological conceptualizations of mindfulness may have important differences.

Keywords Mindfulness assessment · Culture · Content validity

Introduction

Despite a number of points of convergence between Buddhist and Western psychological mindfulness, there are also

important differences. Borrowing from the Buddhist scholar Buddhaghosa, Grossman (2011) described Buddhist and Western psychological mindfulness as “near-enemies”, to the extent that they possess qualities that may outwardly or superficially appear very similar, although these qualities profoundly differ from each other. These differences in conceptualization have important implications for the practice and therapeutic use of mindfulness in the West, as well as for the measures that have been developed to assess this construct.

In the Buddhist context, mindfulness (Pāli: *sati*) has often been defined as remembering and the quality of bearing in mind or bringing to mind (Payutto 1971/1995). Although remembering and bringing to mind are seminal practices of mindfulness meditation, additional factors, such as clear comprehension (*sampajāna*) are essential to the cultivation of right mindfulness (e.g., Wallace 2008). Clear comprehension has been defined as a constant and thorough understanding of impermanence in whatever one does (Panyapatipo n.d.), and it serves as a bridge between the observational function of mindfulness and the development of insight (Bodhi 2011). In terms of practice, in the Discourse on the Establishment of Mindfulness, the Buddha indicated that the contemplation of the four applications of mindfulness (body, feelings, mind, and phenomena) is foundational to the cultivation of right mindfulness. Right mindfulness, along with the other factors of the Noble Eightfold Path, constitute a 2,500-year-old system of training that leads to insight and the overcoming of suffering (Bodhi 2011).

Over the past two decades, Western psychologists have developed an expanding clinical and research interest in mindfulness. Commonly used definitions of mindfulness in this context include a focus of one’s attention in a non-judgmental or accepting way on the experience occurring in the present moment (Kabat-Zinn 1994) and as an awareness of present experience with acceptance (Germer 2005). In

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terms of practice, attention has primarily focused on the integration of these multidimensional mindfulness concepts into psychotherapy treatments (e.g., mindfulness-based cognitive therapy; Segal et al. 2002) with the goal of teaching patients a more mindful approach to reducing distress, preventing relapse, and enhancing quality of life.

In summarizing the areas of divergence between the two, Grossman (2011) suggested that the most profound difference between Buddhist and Western psychological conceptualizations of mindfulness is that Buddhist versions are the result of a 2,500-year development of a phenomenological approach oriented toward a gradual understanding of direct experience, whereas Western psychologist-defined versions are recent attempts to objectify and quantify mindfulness by employing operationalizations that can be understood by and generally have been validated with people untrained in mindfulness practices. Similarly, when Western psychology adopted mindfulness as a therapeutic technique, it inherently altered the nature of the Buddhist goal of practice from the alleviation of general suffering to the remediation and prevention of specific psychological disturbances, such as alcohol misuse and depression (Christopher et al. 2009a; Rosch 2007). The Theravada Buddhist monk Bhikkhu Bodhi (2011) echoed this concern by noting that in the West contemporary meditation is being used to help people obtain release, not from the cycle of birth and death, but from the strains of financial pressures, psychological disorders, and stressful relationships.

Most Buddhist traditions dictate that mindfulness cannot be easily extracted, practiced, and analyzed in isolation from inherently interrelated concepts (Buddhadasa 1988; Rosch 2007). A number of essential elements in the practice of mindfulness have been largely neglected by Western psychology, including Buddhist ethics and clear comprehension (Grossman and Van Dam 2011; Wallace 2008). In fact, numerous discourses in the Pāli canon mention “wrong” mindfulness (*micchā sati*), and this has been generally defined as mindfulness practiced in the absence of diligence (*ātāpi*) and clear comprehension (*sampajāna*; Anālayo 2003). In addition to omitted and neglected practices, other elements of mindfulness have been interpreted differently when integrated into Western psychology. For example, nonjudgmental awareness is a seminal component of most Western psychological mindfulness definitions, and although it is essential to the practice of Buddhist mindfulness as well, judging one’s thoughts and emotions is equally important in terms of directing appropriate attention to the cultivation of wholesome states of mind and the attenuation of unwholesome states (Dreyfus 2011; Wallace 2008; Wallace and Bodhi 2006). Overall, despite areas of overlap, there are a number of important differences in the way in which mindfulness is conceptualized in Buddhism and Western psychology, and this has important implications in terms of how it is assessed.

Mindfulness Measurement Development

Western psychologists have developed a number of self-report scales to assess the impact of engaging in mindfulness practices and the general tendency to be mindful. The Five Facet Mindfulness Questionnaire (FFMQ; Baer et al. 2006) is a widely used scale to assess the tendency to be mindful in daily life. The FFMQ is a 39-item self-report measure that was developed by integrating items from the Mindful Attention Awareness Scale (Brown and Ryan 2003), Freiburg Mindfulness Inventory (FMI; Buchheld et al. 2001), Kentucky Inventory of Mindfulness Skills (KIMS; Baer et al. 2004), Cognitive and Affective Mindfulness Scale (Feldman et al. 2004; Hayes and Feldman 2004), and the Southampton Mindfulness Questionnaire (SMQ; Chadwick et al. 2008) using an exploratory factor analysis of the 112 items comprising the five measures. A five-factor model emerged from the data; four of the five factors were found to be similar to the factors on the KIMS (observing, acting with awareness, nonjudging, and describing) and the fifth factor contained items from the FMI and the SMQ and was identified as a nonreactive stance toward internal experience (i.e., nonreactivity). The five factors displayed adequate to good internal consistency, with alpha values ranging from 0.75 (nonreactivity) to 0.91 (describing). Between-factor correlations were modest, although statistically significant, and ranged from 0.15 to 0.34.

Subsequent research has supported the test–retest reliability of the FFMQ (Isenberg 2009) and the internal consistency of all five facets (Baer et al. 2008; Christopher et al. 2012; de Bruin et al. 2012). Similarly, four out of the five facets (not acting with awareness) were significantly correlated with meditation experience (Baer et al. 2008; Lykins and Baer 2009) and meditators scored significantly higher than non-meditators on all five facets (de Bruin et al. 2012). Lastly, the item-level factorial validity of the FFMQ has been supported among meditators and nonmeditators (Bohlmeijer et al. 2011; Christopher et al. 2012).

Despite the support outlined above, other studies have raised concerns regarding the validity of the FFMQ. In addition to more general concerns regarding the content and wording of items on the overall scale (e.g., see Grossman and Van Dam 2011; Van Dam et al. 2012), two specific problematic aspects of the FFMQ have been the observing and describing facets. The observing facet is composed of items assessing the observation or noticing of sensations, perceptions, thoughts, and feelings, which is an important element of Buddhist mindfulness practice. The primary issue with this facet has been the differences in the way in which items have been interpreted by meditators and non-meditators. For example, the observing facet significantly loads onto an overall mindfulness factor for meditators but not nonmeditators (Baer et al. 2006, 2008; de Bruin et al. 2012). Similarly, Van Dam et al. (2009) found evidence of

differential item functioning (DIF) on the FFMQ between meditators and nonmeditators for five out of the eight observing items, and although the number of items exhibiting DIF decreased among demographically matched samples of meditators and non-meditators (Baer et al. 2011), two observing items continued to exhibit DIF (for an alternative interpretation of the decreased DIF, see Grossman and Van Dam 2011). Collectively, these results suggest that the observing items may have very different meanings for meditators and nonmeditators, and more specifically, that meditation experience may in fact be a prerequisite to these items functioning in the way they were intended. Lastly, the observing facet has demonstrated poor predictive validity (among meditators and nonmeditators); it has not accounted for unique variance relative to the other four facets in the prediction of well-being, depression, anxiety, and stress (Baer et al. 2008; Cash and Whittingham 2010; Christopher et al. 2012; de Bruin et al. 2012).

The describing facet is composed of items assessing the ability to describe or label experiences using words. Similar to the observing facet, describing has demonstrated poor predictive validity (Cash and Whittingham 2010; Christopher et al. 2012; de Bruin et al. 2012) and unexpected or lack of association with other variables, such as positively predicting alcohol-related negative consequences (Fernandez et al. 2010). Although describing has not evidenced the issue of differences in interpretation based on meditation experience found with observing, several authors have questioned whether an ongoing, accurate, detailed, verbal description of one's experience constitutes a core component of mindfulness and should accordingly be a central facet in a mindfulness scale (Bergomi et al. 2012; Grossman and Van Dam 2011). Overall, despite many strengths, a number of issues with the FFMQ remain.

The Toronto Mindfulness Scale (TMS) is a 13-item self-report measure developed to assess the subjective experience of a mindfulness state retrospectively in reference to mindfulness meditation techniques (Lau et al. 2006). The TMS was based on a two-component model of mindfulness: (a) the self-regulation of attention that is focused on experiences in the present moment allowing greater awareness of thoughts, emotions, and sensations and (b) relating to experiences with an orientation of curiosity, acceptance, and openness (Bishop et al. 2004). The initial 35 items were subjected to an exploratory factor analysis and 20 items failed to load or cross-loaded and were removed resulting in a 15-item two factor (i.e., decentering and curiosity) scale. In a subsequent confirmatory factor analysis, all items significantly loaded on to their expected factor; however, two items loaded across factors and were removed resulting in the final 13-item two-factor scale (Lau et al. 2006). Curiosity captures an individual's stance of wanting to learn more about one's experiences and decentering emphasizes awareness of one's experience with some distance and dis-identification rather than being carried away by one's

thoughts and feelings (Lau et al. 2006). Both factors demonstrated good internal consistency (curiosity $\alpha=0.86$, decentering $\alpha=0.87$), construct validity (positive correlations with absorption, awareness of one's surroundings, reflective self-awareness, and psychological mindedness), discriminant validity (nonsignificant correlations with dissociation and social desirability), and sensitivity to change (pre–post increases among participants in Mindfulness-Based Stress Reduction (MBSR); Kabat-Zinn 1990).

However, similar to the FFMQ, other results regarding the validity of the TMS have been mixed. Although, both mindfulness meditators and Shambhala Buddhists with greater than 1 year of meditation experience had higher decentering scores than those with less than 1 year experience, on the curiosity subscale mindfulness meditators evidenced a similar relationship, whereas Shambhala Buddhist practitioners with less meditation experience actually scored higher than those with more experience (Lau et al. 2006). Similarly, although pre–post change scores in decentering predicted post-MBSR scores in perceived stress and psychiatric symptoms, pre–post curiosity change scores did not. Additionally, in a study on the subsequent trait version of the TMS, Davis et al. (2009) found that decentering scores increased as meditation experience increased; however, they found no increase in curiosity scores as meditation experience increased. Overall, much like the FFMQ, elements of the TMS have demonstrated adequate psychometrics; however, unexpected findings among those with meditation experience suggest that there may be problems with the specific way in which mindfulness is assessed by these measures.

Cultural Validity

The issue of validity—and cultural validity in particular—is an area of utmost importance in research on mindfulness assessment and practice. Quintana et al. (2001) defined cultural validity as

The authentic representation of the cultural nature of the research in terms of how constructs are operationalized, participants are recruited, hypotheses are formulated, study procedures are adapted, responses are analyzed, and results are interpreted for a particular cultural group as well as the usefulness of the research for its instructional utility in educating readers about the cultural group being investigated (p. 617).

Because it is grounded in an established 2,500-year-old cultural system of training designed to lead to insight and the overcoming of suffering, this is particularly relevant to mindfulness assessment and practice in Western psychology. Unfortunately, as noted above, Western psychologist-defined versions of mindfulness were developed so that they

can be understood by and generally have been validated with people untrained in mindfulness practices (Grossman and Van Dam 2011). Similarly, in undergoing exportation from a Buddhist context to the world of scientific psychotherapy, mindfulness has been adapted to ensure fit with Western ideals and to enhance its palatability to Western patients (Christopher et al. 2009b; Hall et al. 2011). To ensure that we are developing culturally valid mindfulness-based psychotherapies and assessments, we must include all stakeholders in the processes outlined by Quintana et al. (2001) above. Therefore, given the mixed findings regarding the FFMQ and TMS, the primary goal of this qualitative study was to evaluate the cultural validity of these measures by using cognitive interviews among a sample of Buddhist clergy and laypersons to assess their perceptions of these two scales.

Method

Participants

Data were collected from Buddhist clergy and laypersons at a Zen monastery in Oregon, USA. The clergy at the this monastery practice a synthesis of the Soto and Rinzai Zen traditions, in which mindfulness meditation is a core practice. We consulted with the co-Abbots to identify a group of participants at the monastery with a range of meditation experience (from novice to expert) in order to evaluate the cultural validity of the FFMQ and TMS among a sample with a variety of mindfulness and other meditative practices. We conducted individual cognitive interviews on both measures with a total of 14 residents of the monastery. Fifty percent of the sample ($n=7$) was female (both females and males are ordained as priests), the mean age was 49.43 years ($SD=16.98$, range=30–77), and 86 % ($n=12$) of the sample identified as Euro American, 7 % ($n=1$) as Asian American, and 7 % ($n=1$) as Latina/o American. All 14 participants identified as Zen Buddhists: seven were layperson residents of the monastery, six were ordained Zen priests, and one was currently in the ordination process. The six priests had been ordained for an average of 13.58 years ($SD=10.92$, range=5–33). For the total sample, the mean duration of identifying as a Zen Buddhist was 13.11 years ($SD=13.69$, range=1–43), the mean duration for meditation history was 15.68 years ($SD=14.17$, range=3–43), and the mean frequency of daily formal meditation was 3.21 hours ($SD=1.49$, range=1–6). All participants endorsed currently engaging in mindfulness as well as a variety of other meditation practices (e.g., loving-kindness).

Interview Format

Participants were individually interviewed by the first author as part of a larger mixed-methods research project on

mindfulness. In this study, we report on the results of cognitive interviews we conducted with the 14 Zen Buddhist participants described above. Cognitive interviews are used widely in questionnaire development to assess the thought processes of survey participants and to detect items that are not understood by respondents as intended by the survey developers (Willis 2005). Cognitive interviews also can be used to examine the validity of items with regard to respondents' cultural context and they provide a useful set of tools for examining whether items are being understood similarly across cultures (Napoles-Springer et al. 2006). Given the purpose of our study was to assess the general cultural validity of the FFMQ and TMS, and both are already established measures, we were less interested in analyzing the comprehensibility of specific items among our participants, but rather, how well the content of these measures accurately captured a core aspect (i.e., mindfulness) of their day-to-day cultural practice. Therefore, we separately presented the FFMQ and TMS to each participant during an individual interview, instructed them to read through each measure, and asked them to verbalize their thoughts while answering survey items (i.e., concurrent think alouds; see Van den Haak et al. 2003), which were followed by probes to ask participants about specific themes that emerged from the data (Willis 2005). Additionally, because we wanted the participants to have a clear sense of the rationale behind each measure, prior to presenting them, we informed participants of the factors measured on each scale (FFMQ: observing, describing, acting with awareness, nonjudging, and nonreactivity; TMS: decentering and curiosity), nature of the items (FFMQ: mindfulness and mindlessness; TMS: only mindfulness); and, function of mindfulness assessed (FFMQ: "general tendency to be mindful in daily life"; Baer et al. 2008, p. 334); TMS: "capacity to invoke a mindfulness state" (Lau et al. 2006, p. 1460). Lastly, we asked participants if they believed these measures assess mindfulness as they conceive of it and we also asked them if they had any additional feedback regarding these measures.

Measures

The FFMQ (Baer et al. 2006) evaluates five facets of the tendency to be mindful in daily life (i.e., observing, describing, acting with awareness, nonreactivity, and nonjudging). The development and psychometrics of the FFMQ were reviewed above.

The TMS (Lau et al. 2006) is a two-factor (i.e., curiosity and decentering) measure of the mindfulness state. The development and psychometrics of the TMS were reviewed above.

Statistical Analysis

The individual cognitive interviews were digitally recorded and transcribed. The first two authors independently

reviewed a subset of the transcripts to develop a preliminary coding schema. We then reviewed each others' schemas, determined that there was a high level of agreement, and developed a final coding schema. We then applied the final coding framework to all 14 interviews using Nvivo 9 (QSR International 2010), a software package designed to locate and retrieve relevant segments of qualitative data for analysis.

Results

The data analysis resulted in a number of distinct topics that we categorized as (1) FFMQ content, (2) TMS content, (3) content missing from both measures, and (4) general issues related to mindfulness assessment (see Table 1). Additionally, for the FFMQ and TMS, we further divided content specific topics and codes by whether the content was perceived as being a concern or a strength. We calculated Cohen's kappa to evaluate the percent agreement between the two raters in applying the coding framework to the interviews—while controlling for chance agreement—and the obtained value ($\kappa=0.79$) was within the “excellent” range according to conventions proposed by Fleiss (1981). Each of the topics, codes, and subcodes displayed in Table 1 are explored below with illustrative quotes from the participants.

FFMQ Concerns

Describing

Participants identified a number of specific concerns with the FFMQ. The most salient of these was related to the *describing* facet, where more than half of the sample ($n=8$) shared at least one concern regarding this subscale of the FFMQ. These issues were categorized into three subcodes, the first of which was that it is *not an essential facet of mindfulness*. To explain her reaction to several of the *describing* items, one of our participants stated:

The one that keeps coming up for me is this one ‘I’m good at finding words to describe my feelings’ and ‘I can easily put my beliefs, opinions, and expectations into words’. I look at myself and I know that... mmm...I feel that it’s a description of me, but I don’t know that it has anything to do with mindfulness.

Sharing a similar reaction, another participant commented:

I guess that number seven, I can easily put the beliefs etc. into words, implies that, if you’re aware of those things in yourself objectively that you can describe them and words will do...but, you know mindfulness

Table 1 Concerns and strengths identified by Zen clergy and laypersons on the FFMQ and the TMS

Topics	Perceived as a	Codes	Subcodes
FFMQ	Concern	Describing	Not an essential facet of mindfulness
			Penalizes those who are not good with words
			Difference between awareness of and ability to describe feelings
	Strength	Subjectivity	Awareness of distractibility and judgment can be mindful
			Level of practice can influence interpretation of items
			Repetitive items
TMS	Concern	Misunderstanding of the practice	
		Observing	
		Nonreactivity	
Content Missing From Both	Concern	Meditation instructions/idealized experience	
		Does not assess evolution of practice	
		Intention to return awareness to the present moment	
General Issues	Concern	Curiosity	
		Simplicity	
		Self-assessment of mindfulness is problematic	
		Process of mindfulness is nonlinear	–

gets wordless. Being able to describe it doesn't necessarily make it a mindful experience.

In addition to questioning the relevance of describing or labeling of experience regarding mindfulness assessment, several participants commented that including these items on a mindfulness scale may "penalize" someone who is otherwise quite mindful. More specifically, the second subcode—*penalizes those who are not good with words*—was endorsed by several participants, including the following:

There are several ones of describing 'I'm good at finding words to describe my feelings.' That's hard for me to find words describing my thinking. There are several of these that, I wouldn't necessarily say that they, um...I think it would be different for different people because those particular questions are, sometimes people can't explain their mindfulness, even though they're experiencing mindfulness. I think that's...um...one there was one about, 'I can easily put my beliefs opinions and expectations into words', well not everybody can do that because at some points I wouldn't be able to explain my experience even though I'm having that experience.

Further supporting this theme, one participant commented, "So questions two and seven, both have to do with the ability to express, what's going on internally in words. I know some people who are very mindful but just don't have the vocabulary, they just have difficulty expressing their feelings." Similarly, a participant shared "You know there's people that are just not verbal but that are perfectly in tune with what's going on around them."

The third subcode within the *describing* area was the *difference between awareness of and ability to describe feelings*. Several participants highlighted this distinction, which was articulated by one of our participants as:

'I can usually describe how I feel at the moment in considerable detail', there we go with the words, see I think there's a difference between, I can usually describe how I feel versus I am usually aware of how I feel. You know, that allows you to be completely mindful, express mindfulness without having to be somebody who's used to using their vocabulary.

Relatedly, another participant stated, "Hmm, I wonder, good at finding words to describe my feelings...raises the question for me, are those who are slower at finding the words necessarily less mindful of the feeling."

Subjectivity

Another theme to emerge related to concerns specific to the FFMQ was perceived subjectivity of the items. More

specifically, within this area we identified two primary subcodes, the first of which—*awareness of distractibility and judgment can be mindful*—was related to the content of the acting with awareness and nonjudging items. A participant summarized his reaction to an item related to distractibility by commenting:

'When I do things, my mind wanders off and I'm easily distracted.' You could imagine that, person a and person b would both say that they're easily distracted, but there'd be a big difference between a and b, so in other words, if I were to say when I do things my mind wanders off and I'm easily distracted, does that mean that, you know, that's a sign of not being mindful, um...maybe the fact that the person is aware of the mind wandering off is a sign of being mindful. Because, I mean, a lot of what meditation is, is coming back, is recognizing that you've wandered off.

When asked to elaborate, this same participant further added:

Ah...somebody who is very mindful might just be so aware of when they do get distracted that, they might feel like they're easily distracted but in actuality compared to somebody else not, and so in other words, my point is when that you, when that kind of word is used or that kind of phrase, it's hard for the evaluator to know what it means, and so it's not really a good indicator.

In the same way that several of our participants identified distractibility as potentially mindful, being judgmental was viewed by a number of participants as a potentially mindful activity. Two participants reacted to the specific FFMQ nonjudging item "I make judgments about whether my thoughts are good or bad" by commenting, "In a way you could say that's mindfulness, you're aware of the judgmental mind" and "So if I were to say, often true, does that mean I'm mindful or not mindful?" Echoing a similar concern, another participant shared a recent meditation experience in which he was engaged in a "judgmental mind" activity:

That's the fact of mindfulness, so you can experience anything. So you can experience judgmental mind. I was sitting Tuesday night meditating and breathing and just, noticing this sense of judgmentalness. So it was, so I was telling somebody it was like judge judge judge judge judge judge judge judge judge judge judge judge judge judge judge judge. You know it was just like this continual texture of judgment, so I don't know about a statement like that ['I make

judgments about whether my thoughts are good or bad'] whether it would be a robust indicator.

The second subcode to emerge in the *subjectivity* theme was *level of practice can influence interpretation of items*. Several participants noted how they might be likely to rate themselves more critically on the FFMQ than those with no or little meditation experience. For example, one participant stated:

Measurement like this, I mean it helps to some extent, but, I mean even if a person were to go through and rate these, um...I think, take the first one, 'When I'm walking, I deliberately notice sensations of my body moving.' I mean, somebody who hasn't been practicing mindfulness that long, could always say, oh 'very often or always true', and yet I know through my experience of working with the body, that sensitivity just keeps increasing, increasing, increasing. What it means to have a body and be in a body, and so, I guess, the problem with this kind of testing is that, there is inherent flaw in somebody, um, in the subjectivity of it.

Another participant expressed this concern by noting, "I think the more I practice the more I see, the more honest I reflect on my experience I see how much more work there could be and how much more I could pay attention."

Repetitive Items

In general, a number of participants noticed the similarity among the items on the FFMQ. Some of the reactions participants shared were, "again repeats", "there are two other ones like that", "feels like you have a lot of questions about that", "a couple are very close to each other", and "that's a little questionable in that there's some redundancy". Several participants questioned the rationale for the repetitive items, with one asking, "Do they do that to catch people, being consistent?" The most frequently cited area of concern regarding repetition was the describing items. This appears to have been amplified by the general concern participants had regarding these items, and one participant expressed this by noting, "There we go with the words, this obsession with self-description, with words. And that kept coming up over and over again, and I don't know if that's the best thing."

Misunderstanding of the Practice

The final concern to emerge regarding the FFMQ was related to what a number of participants perceived to be an inaccurate or different conceptualization of mindfulness

relative to their own experience. One participant, for example commented, "These are, in a way, not grandiose, but very confident statements." In summarizing his reaction to the overall FFMQ, another participant stated:

My initial impression is that there's a slight tendency here to think that if you can take a step back and watch and notice things, you are better, you're somehow, you're more mindful than if you are completely engaged and responsive to the environment in an appropriate way. But if my intention is compassionate and beneficent, then I allow myself to really act. Not even necessarily, judging and gauging that action, but knowing that that intention is really there.

Similarly, in responding to the overall FFMQ, another participant commented:

The other thing that is missing on this from my vantage point is this big, the big picture of space. So there is an awareness, for example they ask a question here, 'When I have distressing thoughts or images, I feel calm soon after.' The implication is, I'm not reactive I calm myself down. But to have the big awareness of both calm and distress, and allow them both just to flow through, is not part of this particular scale they're looking at here.

After a long pause with his eyes closed this same participant continued:

You know the important thing is that mindfulness is not necessarily a tool for getting rid of a feeling. So it's not, oh if I'm mindful I won't have to suffer through this crap anymore. It's not designed to necessarily change what's around you or what you're experiencing.

Overall, these four areas of concern are related to various aspects of the FFMQ. In terms of the five factors, participants specifically identified describing items as not capturing an aspect of mindfulness as they practice it. Participants also identified several acting with awareness and nonjudgmental items that they perceived as subjective, and widely open to interpretation. The last two areas of concern cut across the FFMQ facets, but were also related to the other areas of concern. For example, although the issue of repetitive items was identified by participants for the overall FFMQ, this was most frequently identified in the describing items. Lastly, misunderstanding of the practice was a diffuse category that reflected a general lack of convergence between what the FFMQ items assessed and what participants experienced when contemplating their own mindfulness meditation practice.

FFMQ Strengths

Observing

Participants endorsed two primary perceived strengths of the FFMQ. Participants repeatedly expressed their approval for a variety of the *observing* items, particularly in terms of their belief that these items capture mindfulness as they practice it. One participant summarized it as follows:

So a few of the questions like noticing wind or sun on your face, and noticing sort of subtle sounds like a clock ticking and birds chirping, I think those are definitely very good indications of mindfulness. Being able to hear things that are sort of in the background that most people just ignore.

Another participant expressed a very similar reaction:

The ones that have to do with the senses, I think are all pretty important. Like notice the smells in the room, and I hear things, I feel the sun on my face and the wind. I don't know that they're important but I think that they are, for me at least they're a big part of mindfulness. Just being aware of the world around me and how I'm being affected by it.

In addition to the general positive reaction to the *observing* items, a *body awareness* subtopic emerged from the interviews. Because they viewed it as an essential element of their mindfulness practice, several participants commented that they would have liked more *observing* items, specifically, more of those that assess body awareness. When asked what items she would include, one participant responded, "Well I'm aware of...this is kind of clumsy, but when I have strong emotional reactions, I'm aware of my body...because that's really, you know a real mindfulness gauge."

Nonreactivity

A second perceived strength of the FFMQ was the *nonreactivity* facet. The following two comments were in response to the item "When I have distressing thoughts or images, I 'step back' and am aware of the thought or image without getting taken over by it": "That is a big reason why I got into Zen Buddhism. That really resonates, I think that that's really important" and "OK, great, and if you feel like, oh I'm not able to step back, that means that you're not able to have that sort of distance that mindfulness requires, so, I would say, that's a reasonable one in my view." However, whereas *observing* items seemed to tap the mindfulness process, participants noted that *nonreactivity* was more of an outcome of their practice. In responding to a *nonreactivity* item, one participant commented:

'In difficult situations I can pause without immediately reacting'...that's a good one. I mean that right there embodies to me, embodies what is, one of the main fruits of meditation, and mindfulness is that you're no longer bound by your habitual reactions. And so to me that's a sign that somebody's mindfulness practice is working. If there's this little, you know, like hook that applies that refreshes, you don't have to jump into the outburst.

The strengths participants identified in the FFMQ were specific to the two facets of observing and nonreactivity. Participants identified the observing items assessing body awareness as being particularly reflective of their experience, which suggests that those with a Buddhist-oriented meditation practice may perceive the Observing items as most accurately assessing their experience relative to other items on the FFMQ. Lastly, regarding these two strengths, participants generally distinguished between what they perceived to be the process of mindfulness (observing) and an outcome of the practice (nonreactivity).

TMS Concerns

Meditation Instructions/Idealized Experience

We identified two primary TMS concerns; the first was captured by the code *meditation instructions/idealized experience*. Several participants noted that TMS items resembled basic meditation instructions or "statements of the practice". Some expressed concern that participants without any meditation experience who complete this before and after a weekend meditation retreat will increase their score on this measure, but that this might not necessarily mean that they are actually more mindful. Or as one participant stated:

Sounds more like somebody took the training aspects, the cultivation aspects, and put them in here. 'I was more concerned about, with being open to my experience and then to controlling or changing them', well, usually the instructions in meditation tell you to do that [laughing]. 'I was curious to see what my mind was up to from moment to moment', again...you know, all of these are instructions that we give to people, so there's a little bit of implanting here, implanting what you want to get back.

Similarly, several participants spoke about how the idealized nature of the items may encourage impression management. One expressed this concern by saying:

All these things are consistently what you should be feeling so it's strongly skewed that that this is what I'm supposed to have experienced. So it might, you

know, make bias that, well, one way or another, either that people would judge themselves, oh no I am supposed to do that and I didn't or that people will overestimate. Like there's nothing here that allows for people to have had discomfort with it, like my mind was racing and I could, I just couldn't...It's all what they should have experienced, I mean this all just sounds too good.

Does not Assess Evolution of Practice

The second concern was that the TMS *does not assess evolution of practice*. Here, participants responded to what they perceived to be very basic mindfulness practices assessed by the TMS and its potential lack of usefulness among individuals with more advanced meditation experience. One participant said:

I think for beginners this is fantastic. I just think there's such a scale of an evolution of practice so, 'I experience myself as separate from my changing thoughts and feelings' is certainly a skill...the separation of...having the idea of a fixed self so...but, if someone just first starts practicing, to know they're not their thoughts, that's wonderful so that would be, yeah, that would be a great, certainly for beginners, it would be excellent.

Another participant spoke about this theme in relation to a more experienced practitioner:

When I look at this, with this list I think, this is stuff that [a Zen Priest at the monastery] dealt with a long time ago. You know what I mean. He appears to have worked his way through these things.

Overall, the primary concern participants reported with the TMS related to what they perceived to be the simplistic nature of the items. This was expressed in terms of both a concern that these items are too straightforward and do not tap aspects of the practice beyond what might be taught to a novice meditator on a weekend retreat. Interestingly, however, as noted below, a number of participants also reported the simplicity of the TMS as one of its greatest strengths.

TMS Strengths

Curiosity

Two primary strengths of the TMS emerged from the interviews. Regarding *curiosity*, a number of participants responded positively to the word "curious" in the TMS items. One explained her reaction as:

The Toronto scale includes a little bit more of the deliberate aspect. Curiosity is something you really

train people, we use that word a lot, you're curious because it's non-judgmental, you know. So to direct your attention is curiosity.

Another participant stated:

I think as I meditate more I'm becoming more curious about things rather than reactive to them. Yeah, and then, experiencing thoughts as something that's going on in my mind but is not, does not necessarily, accurately reflect what's really true. So the stories, you know you become much more aware of the stories and as you sit longer and then accepting whatever comes.

Simplicity

The second theme to emerge was the participants' reaction to the perceived *simplicity* of the TMS. Participants expressed this in a variety of ways, including "I think just the simplicity of it, so I teach a meditation class and I'd like to give this to my students, it's really interesting to see what their experience is, and if these principles are being communicated", "Um...well I think the Toronto scale pinpoints it better", "I felt like I could fit within the framework of this scale", and "So initially, it just sort of feels like this is, this is a very Buddhist perspective on mindfulness, which I think is good."

The primary strengths participants identified on the TMS were items related to curiosity of one's experience and the overall simplicity of the measure. Several participants reported that curiosity was the foundation for their beginning practice, and those who teach meditation to others noted that they often instruct novices to approach all phenomena from this perspective. As noted above, although the overly simplistic nature of the items TMS was a concern for some participants, others perceived it to be a strength. Those who perceived it as a strength tended to be less experienced meditators or those who viewed this as a useful way to assess student progress when teaching a mindfulness class.

Content Missing from both Measures

In addition to concerns and strengths of each measure, several themes emerged regarding content participants considered to be quite important and they perceived as missing from the FFMQ and TMS. There was a general sense that this content was seminal to the practice and was essential to any attempt to operationalize and assess mindfulness. The primary topic in this area was the importance of having the *intention to return awareness to the present moment*. One participant summarized the issue:

Is there something in here about I notice when I'm not mindful and can redirect myself, there's nothing in here about that kind of intention. Yeah, I don't see either of them, contain...I'm able, I notice when I'm daydreaming and I bring myself, I try to stop that activity and bring myself to what's actually happening. So we don't have any of that, remembering, the term remembering is a kind of technical term in Buddhism, there's none of the remembering that I can see.

In describing the importance of intentional awareness, another participant stated:

If I'm sitting here right, and my intention is so clear to come back, and there's no [finger snap] evaluation there's no [finger snap] gap between noticing it's gone and coming back. So if it's just like [finger snap] you know, the past is gone ok I'm present, I've always been present. Yeah, intention is a really interesting thing, yeah, there's strength of intention, how is that cultivated. In a way that's everything.

The second content area participants identified as missing from both scales was an *awareness of suffering and aversion*. A number of participants described awareness of suffering in particular as an essential aspect of mindfulness practice. In discussing what he perceived to be missing from both scales, one participant commented:

The other thing that's coming for me is, the real essence of Vipassana is not included in either of these, dissatisfaction, and the nature of clinging, the real crux of what Buddhism is about, is not included in here. Yeah, these assessments of mindfulness, I guess it's just not getting at the real essence of liberation of ending suffering.

In response to his statement, the interviewer asked what items he would consider including on a scale to measure this and he responded:

Something like, 'I was aware that when difficult feelings or sensations arose, I reacted with aversion, or attraction to pleasant sensations'. So if I was, when I teach a mindfulness course I emphasize those things directly like looking at *dukkha* [suffering]. Also, 'When I struggled against my experience, suffering arose' or 'When I wanted my mindfulness session to be other than it was, I experienced dissatisfaction.'

Another participant described the importance of aversion by stating, "In noticing aversion, I learned a lot, I learned a lot about myself and that the source of my aversion was always not necessarily what I thought it was."

A third area of perceived missing content among our participants was *extending beyond the self*. Participants generally commented on the problem of a self-focused

assessment given the goal of striving for non-self in Buddhism. As an example one participant commented, "mindfulness can reinforce the self if it's never undercut... awareness of this body and mind and that separation is not the Buddhist teaching so, maybe [the measure] could say I experience that I'm not sure what the I is, or if there is one." Relatedly, another participant stated:

Another thing I notice is this is all basically about oneself. There's nothing in there about, awareness of others or awareness of circumstances, or awareness of, it's all, you know, aware of my thoughts, my reactions, my attention, my mind, so it's kind of narrow or one sided.

Similarly, participants identified a lack of content assessing compassion or concern for others. As an example a participant commented:

This is true particularly in Zen, I think it's true for all Buddhism, that, we're not doing it just for ourselves. We're doing it to develop wisdom and compassion in our relationships and the people, and helping people we meet.

And a fourth participant noted:

Well how do they see themselves as a human being on the earth, do you feel like, you know, you're doing beneficial work for the community or the world as a whole. Something that's outside of them.

The areas identified as missing from both measures highlight the inconsistencies between Buddhist and Western psychological conceptualizations of mindfulness. No items on the TMS directly assess present awareness, and although several items on the FFMQ relate to present experience, none assess the process of deliberately returning awareness to present experience. This was perceived as an essential element of mindfulness practice by a number of participants. Similarly, awareness of suffering and aversion was also described as central to Buddhist practice, but neglected by these measures. Lastly, many participants noted the lack of items referencing interconnectedness with others, and how a self-focus can reinforce the illusion of a self, which is antithetical to Buddhist practice.

General Issues

Two general issues emerged from interview participants regarding the overall measurement of mindfulness, particularly when using self-report rating scales to do so. The first consistent theme to emerge was the concern that the *self-assessment of mindfulness is problematic*. In describing her reaction to completing the FFMQ and TMS, one participant commented "Well, I mean something like this would be,

helpful to some extent, and yet my sense is that, it's tricky because trying to, nail down, trying to really get to the essence of these experiential realities is kind of like trying to nail Jell-O to the wall." When asked to elaborate on her response, she added, "It's hard because this whole process is a non-evaluative process right, it's kind of the conundrum with this research." In similar fashion, when asked his reaction to the use of paper-and-pencil measures of mindfulness, one participant commented, "If someone is assessing how mindful they are they're probably not being mindful you know, that'd be, putting a head on top of the one you already have, so I think being a spectator to one's own meditation or mindfulness, is in a way the antithesis of the practice." When asked for feedback regarding his experience of completing the FFMQ, this same participant commented:

My mind kind of uh, got, uh, fuzzy when I was looking at this one [FFMQ] so I'm not sure I'd be able to give you my...yeah, I'm just confused about what I'm supposed to be doing...I got confused, cause I was looking at these, and I think the time scale just throws me off, the idea of, somebody rating how often they notice the sensations of their body moving... the whole measure, like self-assessment of practice, is not something I do so that just confused my mind.

The second general issue related to the assessment of mindfulness was the concern that the *process of mindfulness is nonlinear*, and therefore an estimate of one's experience or way of being can be variable and mindfulness may not necessarily increase in direct proportion to practice. This general issue was also related to the more specific concern on the FFMQ regarding item subjectivity and interpretation based on practice (see below). In terms of the more general issue, one participant echoed her concern regarding the assumption that meditation practice and FFMQ/TMS score would be linearly related by noting:

I know from my own experience, with my spiritual practice I've seen it go in cycles where I will come into, I'll go through a phase where, the mind just becomes really quiet for a while and I find, I feel this heightened aliveness and sensitivity, and then, the next thing that's hidden in my mind will come up, and I will become, and it will take over for awhile until I get practice at working with it again. So it's like, for me I've just felt, I developed an attitude where I really can't judge where anybody's at in any given moment or myself, because the way, the more that I've practiced I've found that this isn't a linear progression, it kind of spirals in on itself and shifts directions and then, melts into the center and then it's chaotic.

Similarly, another participant stated:

If someone sits there and applies the method for the whole course of retreat it's not a linear thing. But, the mind settles, it's just um, I'm sure you've heard this before but it's like you stir up a bucket of muddy water. And if you quit stirring it, it settles. So someone might feel the mind settle but they might, they might see or start to see a particular facet, of reality, like oh my gosh I want to look into this more, or this particular space of mine was very nice, or I can tell that there's something here that's benefiting me. Or maybe they can't even name it.

The two general issues related to the self-assessment of mindfulness highlight perceived difficulties inherent to measuring this construct. Participants noted that the process of assessing how mindful one is does not fit with the non-evaluative nature of mindfulness and is therefore problematic. Many participants described an ebb and flow to their mindfulness practice, and as such they believed that a cross-sectional assessment of their experience may not be accurate over time. These concerns highlight the difficulties and limitations of conceptualizing and quantifying one's level of mindfulness using self-report measures.

Discussion

In this study, we used cognitive interviews with Zen Buddhist clergy and laypersons to assess the cultural validity of two widely used measures of Western mindfulness. In our analysis, we identified specific concerns and strengths of each scale, as well as perceived content missing from both scales and general issues related to mindfulness self-assessment. A number of the themes that emerged from the data were identified in previous findings on the FFMQ and TMS; however, several new perceived concerns and strengths also arose. Below we highlight the key findings vis-à-vis the extant literature, discuss the limitations of our study, and suggest directions for future research.

FFMQ

When responding to the FFMQ items, participants most frequently expressed concerns regarding describing and support for observing. The concerns related to describing generally converged around the primary theme that these items do not correspond accurately to the lived experience of most of the participants in this study. This concern has been echoed by Western researchers (Bergomi et al. 2012; Grossman and Van Dam 2011), who have questioned the utility of including describing items in a mindfulness measure. Collectively, these findings, along with issues of poor predictive validity (Cash and Whittingham 2010; Christopher et al. 2012;

de Bruin et al. 2012) and unexpected association with other variables (Fernandez et al. 2010) question the usefulness of including items assessing one's ability to describe or label experiences using words on a measure of mindfulness. Alternatively, items on the Observing facet—and items assessing bodily awareness (e.g., “When I'm walking, I deliberately notice the sensations of my body moving”) in particular—were perceived as accurately capturing an essential aspect of mindfulness practice. This is consistent with previous quantitative research among samples of experienced meditators (e.g., Baer et al. 2006, 2008; de Bruin et al. 2012). Similarly, these findings support the theory of Hölzel et al. (2011) that body awareness is one of the primary mechanisms of action through which mindfulness meditation exerts its effects. However, the substantial differences in the psychometrics of the observing facet between meditators and nonmeditators (e.g., Baer et al. 2008; Lilja et al. 2012; Van Dam et al. 2009) poses a unique problem for researchers interested in using this scale. Should, for example, the observing items be omitted when using this measure among a non-meditating sample? This and related questions about the observing and describing facets must be addressed in subsequent research on the FFMQ.

In addition to observing and describing, participants identified several other concerns (subjectivity, repetitive items, and misunderstanding of the practice) and an additional strength (nonreactivity) on the FFMQ. In terms of subjectivity, many acting with awareness and nonjudgmental items that were designed to assess *mindlessness* (e.g., “I make judgments about whether my thoughts are good or bad”) were perceived as potentially valid statements of *mindfulness* by a number of participants. Judging one's thoughts and emotions and the ability to notice that one is easily distractible or overly judgmental are important elements in Buddhist mindfulness practice (Anālayo 2003; Dreyfus 2011; Wallace 2008; Wallace and Bodhi 2006). This subjectivity may partially explain previous findings (Baer et al. 2008; Lykins and Baer 2009) of no mean difference between meditators and nonmeditators on the acting with awareness facet. Relatedly, several participants believed that their meditation experience may in fact make it more likely that they would evaluate themselves more critically on the FFMQ relative to someone with no meditation experience. Although meditators have evinced higher scores than nonmeditators on most FFMQ facets (e.g., de Bruin et al. 2012), in the only study we are aware of in which nonmeditators were directly compared to Buddhist clergy, Thai Theravāda Buddhist monks actually scored significantly lower on observing, describing, and accepting without judgment facets of the KIMS than American college students with no meditation experience (Christopher et al. 2009b). Alternatively, many participants believed that nonreactivity was a strength of the FFMQ, and that these items adequately assess an important aspect of mindfulness, particularly the

ability to distance oneself from habitual responding. In previous research, nonreactivity has demonstrated excellent psychometrics and meditators have consistently scored higher than nonmeditators on this facet (e.g., Baer et al. 2008; de Bruin et al. 2012).

The last two areas of concern on the FFMQ were more general and not specific to any one facet. A number of participants expressed concern about the repetitive nature of the items and this was an important finding given that a primary goal of cognitive interviewing is often to assess for redundant and confusing items (Willis 2005). As noted above, the FFMQ was developed by factor analyzing 112 items comprising five existing self-report mindfulness measures. In developing the FFMQ, Baer et al. (2006) selected items with the highest factor loadings to construct each facet—apparently irrespective of item content—which seems to have resulted in a number of repetitive items. This is particularly problematic for many of the items that were imported from the KIMS, where previous research has identified several extremely large item-level measurement error correlations (Christopher et al. 2009a), which is indicative of redundant items. Recently, Bohlmeijer et al. (2011) developed a 24-item short form of the Dutch FFMQ, which may help to reduce item redundancy. Misunderstanding of the practice was a broad category in which participants expressed that although the FFMQ captured aspects of their mindfulness practice, it did so in an incomplete or inadequate way. Several participants questioned whether scoring high on this scale would indicate that one is actually mindful, because items assessing indispensable elements of the practice, such as clear comprehension and right intent, were absent.

TMS

Whereas participants identified more concerns than strengths on the FFMQ, on the TMS participants identified approximately equal concerns and strengths. The fewer expressed concerns on the TMS may be related to several factors participants alluded to, including fewer items, only mindfulness statements (as opposed to mindless keyed items), and the state-oriented nature of the measure. Interestingly, although many participants identified the simplicity of the TMS as a strength, others expressed concern over what they perceived to be very basic statements of the practice that do not adequately capture more advanced elements. Partially reflecting these concerns, among a Buddhist meditation sample, increased meditation experience did not relate to increased Curiosity scores (Lau et al. 2006). Similarly, using the trait version of the TMS, Davis et al. (2009) found that curiosity did not increase in relation to increasing years of meditation experience, and although decentering did, the relationship was nonlinear and leveled off for participants with a number of years of meditation experience.

Taken together, these results suggest that the TMS, and the curiosity factor in particular, may have limited utility among experienced meditators. Nonetheless, many participants noted that developing curiosity about one's experience is an essential building block in mindfulness practice, and given that the TMS was explicitly developed "as an initial step in a line of research evaluating mindfulness as a mechanism underlying the efficacy of mindfulness-based treatments" (Lau et al. 2006, p. 1449), its ability to detect differences in state mindfulness between highly experienced meditators and nonmeditators may be of less importance.

Content Missing from Both

Participants noted several core concepts of mindfulness they perceived as missing from both the FFMQ and TMS. One omission was intentionally returning awareness to the present moment. In Buddhism, the intentional redirection of attention is an essential part of mindfulness practice (e.g., Anālayo 2003). Although the TMS taps the process of mindfulness, it does not directly address returning awareness to the present moment. The FFMQ, like most mindfulness self-report measures, assesses trait or daily life mindfulness, which may more accurately measure the outcome of having a mindfulness practice (or the innate tendency to be mindful) as opposed to what one actually does during the practice of mindfulness. Two new scales—the Mindfulness Process Questionnaire (Erisman and Roemer 2012) and Meditation Breath Awareness Scores (Frewen et al. 2011)—both measure the intentional use of mindfulness rather than the outcome or success of those attempts and may better tap into the Buddhist construct of remembering. The second perceived omission was an awareness of suffering and aversion. While mindfulness-based interventions have been developed to reduce specific forms of suffering (e.g., depression), there is a fundamental difference between this application and the understanding of suffering within the Buddhist perspective (Grossman and Van Dam 2011). Buddhism arose as a solution to the inherent suffering in life, and suffering is rooted in ignorance of the true nature of experience (including aversion and impermanence). As one participant noted, psychological conceptualizations of mindfulness may not be "getting at the real essence of liberation, of ending suffering", because they do not promote insight into these core concepts. Third, many participants noted that their own mindfulness practice was grounded in compassion and extending beyond the self, whereas the FFMQ and TMS focused on internal experience. This may be the result of distinct philosophical differences between the basic system of psychology, which often aims to strengthen the ego, and Buddhism, which is based in the foundation of non-self. These approaches are in some ways incompatible, and one participant reflected that Western mindfulness may actually

reinforce the self through a focus on internal practice. Similarly, while Western psychological mindfulness has largely excluded ethical behavior and other cultural practices of Buddhism, evidence suggests that these factors strongly influence the benefits of meditation observed among Buddhist monks and practitioners (Carter et al. 2005; Manna et al. 2010; Thananart et al. 2000). Lastly, compassion has been found to mediate the relationship between religion and positive psychosocial outcomes in non-Buddhist samples (Steffen and Masters 2005), and it is associated with increased social connectedness (Hutcherson et al. 2008) and changes in neural regions associated with empathy and emotional processing (Lutz et al. 2008).

General Issues

Participants endorsed two broad general issues related to the process and assessment of mindfulness. The first—that the self-assessment of mindfulness is problematic—revealed the inherent difficulty faced by attempting to use self-report measures to assess this construct among experienced meditators. A general consensus among participants was that the evaluation of one's meditation, particularly via a self-report scale, was antithetical to the practice and likely to be inaccurate. Others have echoed similar concerns, noting that self-reports of trait mindfulness are likely to be influenced by (or actually measure) pathological/wellness characteristics (Rosch 2007) and participants in MBSR and similar mindfulness interventions may be biased by respondents' own desires for gains in performance after expending substantial time and effort in mindfulness practice (Grossman 2011). Second, the concern that the development of mindfulness is a non-linear process is consistent with Buddhist models (Anālayo 2003) and research on long-term meditators (van den Hurk et al. 2011). Similarly, although meditation experience has been correlated with facets of mindfulness such as observing, nonjudgment, and nonreactivity (Baer et al. 2008), other studies have found no linear relationship between meditation experience and other elements of mindfulness, including curiosity (Davis et al. 2009), awareness (Baer et al. 2008), and mindfulness-based attention (Keune and Fortinos 2010).

Limitations and Conclusions

While our study uniquely contributes to the literature on mindfulness assessment, the small Zen Buddhist sample limits the conclusions that can be drawn from these findings in several ways. These results may reflect specific characteristics and beliefs of this particular Zen Buddhist group relative to other groups (e.g., Theravada and Tibetan Buddhists). Similarly, although all participants identified as a practicing Zen Buddhist, the majority of the sample also

identified as European American, and this may have also limited the variability in perspective among our participants. Additional research in this area with larger, more diverse Buddhist samples is needed.

We view these results as part of a first step in developing a culturally sensitive measure of mindfulness that can be used in a variety of contexts. In addition to addressing issues of validity, a new mindfulness measure would ideally be adaptable based on the research questions and populations under study. This will require resolving issues outlined above, as well as additional differences between existing scales, such as whether they assess state or trait, process or outcome, and mindfulness or mindlessness. The Patient-Reported Outcomes Measurement Information System (PROMIS; www.nihpromis.org) may be one important way to achieve this goal. PROMIS is an NIH Roadmap initiative designed to improve self-reported outcomes using state-of-the-art qualitative and quantitative psychometric methods. Through this initiative a number of calibrated item banks have been developed to assess domains such as depression, anger, anxiety, sleep disturbance, physical functioning, and social participation (for an example, see Pilkonis et al. 2011). We believe the PROMIS framework can be essential to the development of a multifaceted item bank of mindfulness items that can be adapted to the context in which they will be used.

Despite the wave of enthusiasm and preliminary research support for mindfulness, our results, along with other recent findings, suggest that there may be important elements of this thousands of years old practice that have been neglected or altered upon its integration into Western psychology and medicine. Whether or not this impacts its effectiveness in reducing suffering is unknown; however, the practical experience of the participants in this study and other Buddhist clergy and scholars suggests that these fundamental differences have important consequences. Although we are not advocating for throwing the proverbial baby out with bathwater, we agree with Grossman (2011) and others who have urged caution in professing extreme confidence and certainty in the research and assessment of this inherently alien way of being in Western society. To do otherwise, is in fact, the epitome of mindlessness.

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References

- Anālayo. (2003). *Satipatthāna: the direct path to realization*. Cambridge: Windhorse.
- Baer, R. A., Smith, G. T., & Allen, K. B. (2004). Assessment of mindfulness by self-report: the Kentucky Inventory of Mindfulness Skills. *Assessment, 11*, 191–206. doi:10.1177/1073191104268029.
- Baer, R. A., Smith, G. T., Hopkins, J., Krietmeyer, J., & Toney, L. (2006). Using self-report assessment methods to explore facets of mindfulness. *Assessment, 13*, 27–45. doi:10.1177/1073191105283504.
- Baer, R. A., Smith, G. T., Lykins, E., Button, D., Krietmeyer, J., Sauer, S., et al. (2008). Construct validity of the Five Facet Mindfulness Questionnaire in meditating and nonmeditating samples. *Assessment, 15*, 329–342. doi:10.1177/1073191107313003.
- Baer, R. A., Samuel, D. B., & Lykins, E. L. B. (2011). Differential item functioning on the Five Facet Mindfulness Questionnaire is minimal in demographically matched meditators and nonmeditators. *Assessment, 18*, 3–10. doi:10.1177/1073191110392498.
- Bergomi, C., Tschacher, W., & Kupper, Z. (2012). Measuring mindfulness: first steps towards the development of a comprehensive mindfulness scale. *Mindfulness*. doi:10.1007/s12671-012-0102-9.
- Bishop, S. R., Lau, M., Shapiro, S., Carlson, L., Anderson, N. D., Carmody, J., et al. (2004). Mindfulness: a proposed operational definition. *Clinical Psychology: Science and Practice, 11*, 230–241. doi:10.1093/clipsy.bph077.
- Bodhi, B. (2011). What does mindfulness really mean? A canonical perspective. *Contemporary Buddhism, 12*, 19–39. doi:10.1080/14639947.2011.564813.
- Bohlmeijer, E., ten Klooster, P. M., Fledderus, M., Veehof, M., & Baer, R. (2011). Psychometric properties of the Five Facet Mindfulness Questionnaire in depressed adults and development of a short form. *Assessment, 18*, 308–320. doi:10.1177/1073191111408231.
- Brown, K. W., & Ryan, R. M. (2003). The benefits of being present: mindfulness and its role in psychological well-being. *Journal of Personality and Social Psychology, 84*, 822–848. doi:10.1037/0022-3514.84.4.822.
- Buchheld, N., Grossman, P., & Walach, H. (2001). Measuring mindfulness in insight meditation (Vipassana) and meditation-based psychotherapy: the development of the Freiburg Mindfulness Inventory (FMI). *Journal for Meditation and Meditation Research, 1*, 11–34.
- Buddhadasa, B. (1988). *Mindfulness with breathing: A manual for serious beginners*. Boston: Shambhala.
- Carter, O. L., Presti, D. E., Callistemon, C., Ungerer, Y., Liu, G. B., & Pettigrew, J. D. (2005). Meditation alters perceptual rivalry in Tibetan Buddhist monks. *Current Biology, 15*, 412–413. doi:10.1016/j.cub.2005.05.043.
- Cash, M., & Whittingham, K. (2010). What facets of mindfulness contribute to psychological well-being and depressive, anxious and stress-related symptomatology? *Mindfulness, 1*, 177–182. doi:10.1007/s12671-010-0023-4.
- Chadwick, P., Henber, M., Mead, S., Lilley, B., & Dagnan, D. (2008). Responding mindfully to unpleasant thought and images: reliability and validity of the Southampton Mindfulness Questionnaire. *British Journal of Clinical Psychology, 47*, 451–455. doi:10.1348/014466508X314891.
- Christopher, M. S., Charoensuk, S., Gilbert, B. D., Neary, T. J., & Pearce, K. L. (2009a). Mindfulness in Thailand and the United States: a case of apples versus oranges? *Journal of Clinical Psychology, 65*, 590–612.
- Christopher, M. S., Christopher, V., & Charoensuk, S. (2009b). Assessing “Western” mindfulness among Thai Theravāda Buddhist Monks. *Mental Health, Religion & Culture, 12*, 303–314. doi:10.1080/13674670802651487.
- Christopher, M. S., Neuser, N. J., Michael, P. G., & Baitmangalkar, A. (2012). Exploring the psychometric properties of the Five Facet Mindfulness Questionnaire. *Mindfulness, 3*, 124–131. doi:10.1007/s12671-011-0086-x.
- Davis, K. M., Lau, M. A., & Cairns, D. R. (2009). Development and preliminary validation of a trait version of the Toronto Mindfulness

- Scale. *Journal of Cognitive Psychotherapy: An International Quarterly*, 23, 185–197.
- de Bruin, E. I., Topper, M., Muskens, J. G. A. M., Bögels, S. M., & Kamphuis, J. H. (2012). Psychometric properties of the Five Facet Mindfulness Questionnaire (FFMQ) in a meditating and a non-meditating sample. *Assessment*, 19, 187–197. doi:10.1177/1073191112446654.
- Dreyfus, G. (2011). Is mindfulness present-centered and non-judgmental? A discussion of the cognitive dimensions of mindfulness. *Contemporary Buddhism*, 12, 41–54. doi:10.1080/14639947.2011.564815.
- Erisman, S. M., & Roemer, L. (2012). A preliminary investigation of the process of mindfulness. *Mindfulness*, 3, 30–43. doi:10.1007/s12671-011-0078-x.
- Feldman, G.C., Hayes, A.M., Kumar, S.M., Greeson, J.M. (2004). *Development, factor structure, and initial validation of the Cognitive and Affective Mindfulness Scale*. Unpublished manuscript.
- Fernandez, A. C., Wood, M. D., Stein, L. A. R., & Rossi, J. S. (2010). Measuring mindfulness and examining its relationship with alcohol use and negative consequences. *Psychology of Addictive Behavior*, 24, 608–616. doi:10.1037/a0021742.
- Fleiss, J. L. (1981). The measurement of interrater agreement. In J. L. Fleiss, B. Levin, & M. C. Pail (Eds.), *Statistical methods for rates and proportions* (3rd ed.). New York: Wiley.
- Frewen, P. A., Lundberg, E., MacKinley, J., & Wrath, A. (2011). Assessment of response to mindfulness meditation: mediation breath attention scores in association with subjective measures of state and trait mindfulness and difficulty letting-go of depressive cognition. *Mindfulness*, 2, 254–269. doi:10.1007/s12671-011-0069-y.
- Germer, C. K. (2005). Mindfulness: What is it? What does it matter? In C. K. Germer, R. D. Siegel, & P. R. Fulton (Eds.), *Mindfulness and psychotherapy* (pp. 3–27). New York: Guilford.
- Grossman, P. (2011). Defining mindfulness by how poorly I think I pay attention during everyday awareness and other intractable problems for Psychology's (re) invention of mindfulness: comment on Brown et al. (2011). *Psychological Assessment*, 23, 1034–1040. doi:10.1037/a0022713.
- Grossman, P., & Van Dam, N. T. (2011). Mindfulness by any other name...: trials and tribulations of *sati* in Western psychology and science. *Contemporary Buddhism*, 12, 219–239. doi:10.1080/14639947.2011.564841.
- Hall, G. C. N., Hong, J. J., Zane, N. W. S., & Meyer, O. L. (2011). Culturally competent treatment for Asian Americans: the relevance of mindfulness and acceptance-based psychotherapies. *Clinical Psychology: Science and Practice*, 18, 215–231. doi:10.1111/j.1468-2850.2011.01253.x.
- Hayes, A. M., & Feldman, G. (2004). Clarifying the construct of mindfulness in the context of emotion regulation and the process of change in therapy. *Clinical Psychology: Science and Practice*, 11, 255–262. doi:10.1093/clipsy.bph080.
- Hölzel, B. K., Lazar, S., Gard, T., Schuman-Olivier, Z., Vago, D. R., & Ott, U. (2011). How does mindfulness work? Proposing mechanisms of action from a conceptual and neural perspective. *Perspectives on Psychological Science*, 6, 537–559. doi:10.1177/17456916111419671.
- Hutcherson, C.A., Seppala, E.M., Gross, J.J. (2008). *I don't know you but I like you: Loving kindness meditation increases positivity toward others*. Paper presentation at the 6th annual conference Integrating Mindfulness-Based Interventions into Medicine; Worcester, MA: Health Care & Society.
- Isenberg, L. (2009). *Mindfulness—life with attention and awareness: test-retest reliability of the FFMQ for Dutch fibromyalgia patients*. Unpublished master's thesis, University of Twente.
- Kabat-Zinn, J. (1990). *Full catastrophe living: using the wisdom of your body and mind to face stress, pain, and illness*. New York: Dell Publishing.
- Kabat-Zinn, J. (1994). *Wherever you go, there you are: mindfulness meditation in everyday life*. New York: Hyperion.
- Keune, P. M., & Fortinos, D. P. (2010). Mindfulness meditation: a preliminary study on meditation practice during everyday life activities and its association with well-being. *Psychological Topics*, 19, 373–386.
- Lau, M. A., Bishop, S. R., Segal, Z. V., Buis, T., Anderson, N. D., Carlson, L., et al. (2006). The Toronto mindfulness scale: development and validation. *Journal of Clinical Psychology*, 62, 1445–1467. doi:10.1002/jclp.20326.
- Lilja, J. L., Lundh, L., Josefsson, T., & Falkenstrom, F. (2012). Observing as an essential facet of mindfulness: a comparison of FFMQ patterns in meditating and non-meditating individuals. *Mindfulness*. doi:10.1007/s12671-012-0111-8.
- Lutz, A., Brefczynski-Lewis, J., Johnstone, T., & Davidson, R. J. (2008). Regulation of the neural circuitry of emotion by compassion meditation: effects of meditative expertise. *PLoS ONE*, 3, e1897. doi:10.1371/journal.pone.00011897.
- Lykins, E. L. B., & Baer, R. A. (2009). Psychological functioning in a sample of long-term practitioners of mindfulness meditation. *Journal of Cognitive Psychotherapy*, 23, 226–241. doi:10.1891/0889-8391.23.3.226.
- Manna, A., Raffone, A., Perrucci, M. G., Nardo, D., & Romani, G. L. (2010). Neural correlates of focused attention and cognitive monitoring in meditation. *Brain Research Bulletin*, 82, 46–56. doi:10.1016/j.brainresbull.2010.03.001.
- Napoles-Springer, A. M., Santoyo-Olsson, J., O'Brien, H., & Stewart, A. L. (2006). Using cognitive interviews to develop surveys in diverse populations. *Medical Care*, 44, S21–S30.
- NVivo 9 qualitative data analysis software (2010). QSR International Pty Ltd.
- Panyapatipo, A.P. (n.d.). *Sati-sampajāna: mindfulness and self-awareness*. Retrieved from <http://www.panyapatipo.com/bookseng.html>.
- Payutto, P. P. (1995). *Buddhadhamma: natural laws and values for life* (G.A. Olson, trans.). Albany: State University of New York Press. Original work published 1971.
- Pilkonis, P. A., Choi, S. W., Reise, S. P., Stover, A. M., Riley, W. T., Cella, D., et al. (2011). Item banks for measuring emotional distress from the Patient-Reported Outcomes Measurement Information System (PROMIS®): depression, anxiety, and anger. *Assessment*, 18, 263–283. doi:10.1177/1073191111411667.
- Quintana, S. M., Troyano, N., & Taylor, G. (2001). Cultural validity and inherent challenges in quantitative methods for multicultural research. In J. G. Ponterros, J. M. Casas, L. A. Suzuki, & C. M. Alexander (Eds.), *Handbook of multicultural counseling* (2nd ed., pp. 604–630). Thousand Oaks: Sage.
- Rosch, E. (2007). More than mindfulness: when you have tiger by the tail, let it eat you. *Psychological Inquiry*, 18, 258–264. doi:10.1080/10478400701598371.
- Segal, Z. V., Williams, J. M. G., & Teasdale, J. D. (2002). *Mindfulness-based cognitive therapy for depression: a new approach to preventing relapse*. New York: Guilford Press.
- Steffen, P. R., & Masters, K. S. (2005). Does compassion mediate the intrinsic religion–health relationship? *Annals of Behavioral Medicine*, 30, 217–224.
- Thananart, M., Tori, C. D., & Emavardhana, T. (2000). A longitudinal study of psychosocial changes among Thai adolescents participating in a Buddhist ordination program for novices. *Adolescence*, 35, 285–293.
- Van Dam, N. T., Earlywine, M., & Danoff-Burg, S. (2009). Differential item function across meditators and non-meditators on the Five Facet Mindfulness Questionnaire. *Personality and Individual Differences*, 47, 516–521. doi:10.1016/j.paid.2009.05.005.
- Van Dam, N. T., Hobkirk, A. L., Danoff-Burg, S., & Earlywine, M. (2012). Mind your words: positive and negative items create

- method effects on the Five Facet Mindfulness Questionnaire. *Assessment*, 19, 198–204. doi:10.1177/1073191112438743.
- Van Den Haak, M., De Jong, M., & Schellens, P. J. (2003). Retrospective vs. concurrent think-aloud protocols: testing the usability of an online library catalogue. *Behaviour & Information Technology*, 22, 339–351. doi:10.1080/0044929031000.
- Van den Hurk, P. A., Wiggins, T., Gionmi, F., Barendregt, H. P., Speckens, A. E., & van Schie, H. T. (2011). On the relationship between the practice of mindfulness meditation and personality—an exploratory analysis of the mediating role of mindfulness skills. *Mindfulness*, 2(3), 194–200. doi:10.1007/s12671-011-0060-7.
- Wallace, B. A. (2008). A mindful balance: what did the Buddha really mean by “mindfulness?” [Interview with B. Alan Wallace]. *Tricycle*, 17, 60–65.
- Wallace, B.A., & Bodhi, B. (2006). *The nature of mindfulness and its role in Buddhist meditation: A correspondence between B. Alan Wallace and the venerable Bhikkhu Bodhi*. Unpublished manuscript, Santa Barbara Institute for Consciousness Studies, Santa Barbara, CA.
- Willis, G. B. (2005). *Cognitive interviewing*. Thousand Oaks: Sage.