

The Difficulty of Defining Mindfulness: Current Thought and Critical Issues

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Abstract In the last decade, a surge of interest has been directed towards the empirical investigation of the concept and applications of mindfulness. If one considers the increasing evidence about the clinical benefits and the psychological and neurobiological correlates of current mindfulness based interventions (MBIs), it is surprising that significantly lower effort has been directed towards the achievement of a consensus about an unequivocal operationalization of mindfulness within modern Western psychology. Accordingly, the present review aims to summarize traditional and current perspectives about mindfulness, to discuss the extent to which modern definitions of mindfulness differ from more traditional definitions and, more specifically, the limitations of current questionnaires that are thought to measure mindfulness levels, and to provide suggestions for future research on this topic. In sum, according to authors well versed in the original Buddhist literature, from which several MBIs are overtly or implicitly derived, modern attempts to operationalize mindfulness have consistently failed to provide an unequivocal definition of mindfulness, which takes into account the complexity of the original definitions of mindfulness. Although the concept of mindfulness remains elusive and difficult to capture by means of modern self-report questionnaires, however, several alternatives exist that could shed light on closely related constructs, which could deepen our understanding of mindfulness and that could lead to the

development of new, not yet considered, categories of psychological effects associated with mindfulness training.

Keywords Mindfulness · Buddhism · MBSR · Assessment · Construct

Introduction

In the last decade, a surge of interest has been directed towards the empirical investigation of the concept and applications of mindfulness. Primarily known as an element of the Buddhist tradition (e.g., Gunaratana 2002; Thera 1973), the concept of mindfulness has gained, in more recent times, increasing attention in both scientific and lay communities as a means to deal with a large variety of physical and psychological disorders (Chiesa and Serretti 2010; Keng et al. 2011). Indeed, following the introduction of Mindfulness based stress reduction (MBSR) in clinical setting at the end of the 1970s (Kabat-Zinn 1982, 1990), an increasing number of interventions aimed at helping practitioners cultivate mindfulness in their daily life including, among others, Mindfulness-based cognitive therapy (MBCT; Segal et al. 2002), mindfulness-based relapse prevention (Witkiewitz et al. 2005), Dialectical behavior therapy (DBT; Linehan 1993), and Acceptance and Commitment Therapy (ACT; Hayes et al. 1999) have subsequently been developed to best fit the unique features of an increasingly larger number of clinical conditions (Keng et al. 2011).

Taken together, mindfulness-based interventions (MBIs) have shown efficacy for several mood and anxiety disorders (Chiesa and Serretti 2011b; Hofmann et al. 2010; Ruiz 2010), for miscellaneous types of chronic pain such as musculoskeletal pain, rheumatoid arthritis, and fibromyalgia (Chiesa and Serretti 2011a), for the reduction of psychological symptoms in cancer patients (Ledesma and Kumano

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2009; Shennan et al. 2011), for borderline personality disorder patients (Lynch et al. 2007), and for the reduction of stress levels in healthy subjects (Chiesa and Serretti 2009). Psychological studies further suggest that increased acceptance, self-compassion, and positive emotions as well as decreased rumination and negative emotions might account for the clinical benefits underpinning MBIs (Keng et al. 2011). Furthermore, evidence from neurobiological and neuropsychological studies indicates that meditation-based MBIs are associated with significant changes in brain function and architecture that are suggestive of improved levels of attention, memory, and executive functions (Chiesa et al. 2011b), of a favorable impact on sleep and cortisol secretion (Brand et al. 2012), as well as of reduced emotional reactivity and enhanced emotional balance (Chiesa et al. 2010, 2011a; Lutz et al. 2008).

If one considers the increasing evidence about the clinical benefits and the psychological and neurobiological correlates of MBIs, it is surprising that significantly lower effort has been directed towards the achievement of a consensus about an unequivocal definition of mindfulness within modern Western psychology (Malinowski 2008). Indeed, significant differences exist among different definitions of mindfulness (Grossman 2008). As a consequence, the extent to which the large variety of interventions currently subsumed under the rubric of MBIs actually represent a unique rather than an heterogeneous groups of practices linked by the same label “mindfulness” (Chiesa and Malinowski 2011) is unclear. On the other hand, a critical appraisal of current conceptualizations of mindfulness could largely benefit the understating and further development of the empirical research into MBIs. Accordingly, the aims of the present work are (1) to summarize traditional and current perspectives about the concept of mindfulness, (2) to discuss the extent to which modern definitions of mindfulness differ from more traditional definitions and, more specifically, the limitations of current questionnaires that are thought to measure mindfulness levels, and (3) to provide suggestions for future research on this topic.

The Concept of Mindfulness Within the Buddhist Tradition

A complete description of the Buddhist conceptualization of mindfulness is beyond the scope of the present article, and the present section is not meant to be a comprehensive summary but rather a brief exposure of the main features of mindfulness according to classical literature. Early conceptualizations of mindfulness can be found in traditional Buddhist scriptures such as the Abhidhamma (Kiyota 1978) and the Vishuddimaggā (Buddhaghosa 1976). The Abhidhamma is a classic scholastic compilation of Buddhist

psychology and philosophy, and the Vishuddimaggā is a summary of the part of the Abhidhamma that deals with meditation. The original term of what is commonly referred to as mindfulness is *Sati*, a Sanskrit word that has been both used to indicate a lucid awareness of what is occurring within the phenomenological field and as a term that could be translated as “remembrance” or memory (Bodhi 2011). Indeed, mindfulness has traditionally been defined as an understanding of what is occurring, before or beyond conceptual and emotional classifications about what is or has taken place (Brown et al. 2007). Furthermore, mindfulness has also been defined as a development of one’s own memory. This, in turn, is supposed to enhance the ability not to forget past experience so as to facilitate greater awareness and sense of purpose for one treading the ethical development emphasized by traditional mindfulness practices (Analayo 2006).

In classical Buddhism, the development of *Sati* is not seen as an end in itself. Rather, such development is considered as a valuable attainment inasmuch as it reduces human suffering related to the erroneous concept of a permanent individual ego and ultimately leads to a calm and contented state characterized by sustained emotional balance and psychological well being (Gethin 2001). To achieve this goal, several methods designed to eliminate suffering are employed. Of note, such methods are usually not concerned with modifying external contingencies. Rather, they involve changes in one’s own cognitive and emotional states. Indeed, the root of suffering is considered, according to classical literature, to be a set of correctable defects that affect all the mental states of an untrained person (Gethin 2001; Lutz et al. 2008).

Furthermore, according to classical literature, the development of mindfulness in one’s own life is substantially associated with an ethical development consisting, firstly, of “guarding” oneself in order to be of service to others and, secondly, of “guarding” others by the practices of patience, harmlessness, loving kindness, and compassion (Gilpin 2009). Such ethical development is considered as an essential part of the “Ennobling Eightfold Path,” which was taught by the historical Buddha (literally “the awakened one”) as a means to “enlightenment” and to the ultimate cessation of suffering. In the Ennobling Eightfold Path, mindfulness or, more appropriately “right” mindfulness, is the seventh element. The other seven elements include morality (*Sila*; right speech, right action, and right livelihood), concentration (*Samatha*; right effort, right concentration, and right mindfulness), and finally, wisdom (*Paññā*; right understanding and right thought). The word “right” assumes, within this context, an important meaning because it underscores that Buddhist mindfulness is not an ethically neutral practice but requires an ethical prejudgment of what is considered wholesome/skilful and unwholesome/

unskillful. In other words, according to such classical perspective on mindfulness, a degree of ethical judgment is necessary to the proper practice of mindfulness (Dhammika 1990).

A further important issue that has raised significant confusion in modern Western psychology concerns the relationship existing between mindfulness and meditation and between mindfulness practices and concentrative practices. Even though the link between mindfulness and meditation has sometimes been criticized (e.g., Hayes and Shenk 2004), such relationship should not be disregarded. Indeed, not only traditional mindfulness practices (Gunaratana 2002; Kapleau 1965; Nydahl 2008) but also several modern MBIs are explicitly based upon specific meditation techniques (Kabat-Zinn 1990; Segal et al. 2002; Witkiewitz et al. 2005).

In addition, one of the most commonly cited classifications of meditation practices suggests a distinction of two main meditative styles, mindful types, and concentrative types of meditation, depending on how the attentional processes are directed (Goleman 1988). According to such distinction, some practices are specifically concerned with the development of concentration, which involves focused attention on a given object such as a sensation, an image or a mantra, while excluding potential sources of distractions. On the other hand, other meditation practices are mainly concerned with the development of an open monitoring of the whole sensory and cognitive/affective fields and include a meta-awareness or observation of the ongoing contents of thought (Cahn and Polich 2006; Lutz et al. 2008; Ospina et al. 2007). In addition, several meditative techniques are described as lying somewhere on a continuum between the poles of these two general methods (Andresen 2000; Shapiro and Walsh 1984; Wallace 1999).

More recently, however, authors well versed in the original Buddhist literature, from which several MBIs are overtly or implicitly derived, have started raising criticism regarding the very validity of such a classification (Gilpin 2009; Lutz et al. 2008; Rapgay and Bystrisky 2009). In particular, concentrative and mindfulness meditation practices are no longer described as opposed processes. Instead, several authors recognize that they usually share a common background of focused attention (concentration), which can take different directions depending on the specific meditation form (Lutz et al. 2008; Rapgay and Bystrisky 2009). In particular, there is nowadays substantial agreement that these two types of meditations should be more properly conceptualized as occupying orthogonal axes rather than opposed directions on a continuum and that mindfulness meditations often include some degree of concentration (Chambers et al. 2009). In accordance with such view, some authors point out that Samatha and Vipassana practices (which are the original terms designed to indicate

respectively the concentrative and the open monitoring/mindfulness aspects of meditation) should be considered as two aspects of the same meditative state (Lutz et al. 2008; Thrangu and Johnson 2004). While the former primarily concerns the stability of the meditative state, the latter concerns the specific phenomenological “angle” from which the receptive field can be observed (Thrangu and Johnson 2004).

Practically speaking, early phases of the meditative training are usually concerned with the development of concentration. In particular, at such stage, the aim of the meditator is to keep the attention focused onto the breath or another object without distractions, such as different sensations, memories, and so forth. Any time the mind wanders and the meditator notices that, he has to voluntarily keep the mind back onto the object of meditation. In contemporary Vipassana, Zen and Tibetan practice, focusing the attention on the breath (or sometimes another static object) is often used as a means to develop the basic level of concentration required for more advanced forms of meditation (Gunaratana 2002; Kapleau 1965; Nydahl 2008). Indeed, historical accounts of meditation suggest that concentrative attention should be mastered before receptive attention is cultivated (e.g. Kapleau 1965), so as to avoid mind wandering and train the mind to be anchored to the present moment (Brown 1977). As the meditation practice advances, the monitoring skill becomes the main point of transition into mindfulness/open monitoring practice, which is characterized by a gradual reduction of the focus on an explicit object and a concurrent monitoring of all present moment experiences without any explicit object (Lutz et al. 2008). The main aim of such practice is to perceive an experience in its stark form stripped of its projective and associative meanings (Thera 1973).

Finally, although, as we will see in more detail below, the concept of mindfulness is frequently equated with the concept of acceptance, several authors have cautioned against such an equation. Rather, they underscore that, according to the classical perspective of mindfulness, acceptance is an attitude that is brought to both mindfulness and concentration practices but is not an inherent aspect of neither mindfulness nor concentration (Mikulas 2011). Rather, according to the Buddhist perspective of mindfulness, an attitude of acceptance and curiosity is used to bring a sense of lightness to the repeated refocusing of attention on the chosen object (Grabovac et al. 2011). As an untrained mind is easily distracted by ruminative or narrative thought processes, attention must be refocused many times. During this repeated refocusing, an attitude of acceptance prevents negative thoughts, such as self-judgment and resultant mental proliferation, from arising and prevents the practice itself from becoming a source of aversion. As the practice deepens, acceptance helps relax the attention and allows rapid, discrete sensations to be more easily noticed and followed during mindfulness practice. Furthermore, higher acceptance can also be considered as a result of

practicing awareness and concentration (Kohls et al. 2009). In conclusion, acceptance should more properly be described as a quality of awareness that can both help the development and is the result of concentration and mindfulness but is distinct from both concentrative and mindfulness types of meditation (Grabovac et al. 2011).

In sum, according to classical literature, mindfulness concerns a lucid awareness of what is occurring within the phenomenological field and meditation plays a key role in the development of mindfulness. In particular, for the correct development of mindfulness, both concentrative and open monitoring skills should be developed with the main aim of keeping the mind anchored to present moment experience and perceiving an experience in its stark form free from one's own projections and misunderstandings. Finally, an attitude of acceptance is thought to facilitate and to be the result of the development of both mindfulness and concentration.

The Concept of Mindfulness within Modern Western Psychology

To what extent modern Western clinically-oriented interventions have incorporated elements of classical mindfulness? And how modern Western psychologists attempted to operationalize the construct of mindfulness in a way that could be used for clinical and research purposes? One of the first “modern” definitions of mindfulness was provided by Jon Kabat-Zinn, the founder of the MBSR program, who described mindfulness as “paying attention in a particular way, on purpose, in the present moment, and non-judgmentally” (Kabat-Zinn 1994), or alternatively 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). Bishop et al. (2004) attempted to operationalize Kabat-Zinn's definition of mindfulness. Such authors suggested that mindfulness should be considered as a particular focus of attention characterized by at least two distinct features: the first one involving self-regulation of attention towards the immediate present moment, the second pertaining to the adoption of an orientation marked by curiosity, openness, and acceptance. More in detail, the former component describes mindfulness as a form of mental skill or state that emerges when the individual is purposefully addressing one's own attention to present moment experience, whereas the latter accounts for personality characteristics that underlie mindfulness tendencies, both of which are intricately linked (Bishop et al. 2004). Even though such a theoretical definition of mindfulness was specifically conceived to be employed in current research, it is worth mentioning that a psychometric scale (Lau et al. 2006) designed to assess mindfulness in terms of the definition by Bishop and colleagues did not yield complete support to their definition (see below).

In a following paper, Shapiro et al. (2006) suggested a three-component model of mindfulness to explain how mindfulness practice affects positive change. In addition to attention and attitude, which are similar to the two components of Bishop et al. (2004), they underscored that intention, i.e., the personal motivation or vision why somebody engages with mindfulness practice, needs to be considered as well. Such hypothesis was based upon the notion that the outcome of meditation practice might depend on the specific intentions of the practitioners (Shapiro 1992). According to these authors, mindfulness training would lead to a fundamental change in the relationship to experience (re-perceiving), which, in turn, would allow for changes in self-regulation, values clarification, cognitive and behavioral flexibility, and exposure. Of note, a subsequent study aimed at testing the validity of such a model found that, when mindfulness and re-perceiving scores were combined, there was evidence for a partial support for the mediating effect of the four variables mentioned above on measures of psychological distress (Carmody et al. 2009).

It is worth mentioning, however, that the examples reported above are just a few examples as to how mindfulness has been conceptualized into modern Western psychology and other descriptions exist that differently describe mindfulness in ways which could be understood by current Western researchers [see, as an example Langer (1989), Langer (2000), Teasdale et al. (1995) for further details].

As one can see, these modern definitions of mindfulness are expressed in such a way that is more in line with current Western psychological theoretical frameworks and are more easily understandable by clinicians involved with such a topic. However, they do not yet allow to quantify mindfulness in a way that could allow to answer to several key questions including the following. Do mindfulness levels increase following the participation into a MBI? Are such increases specific to mindfulness practice or are they more properly attributable to other nonspecific effects? And, most importantly, is it possible to provide an unequivocally defined operational definition of mindfulness? In the last decade several psychometric questionnaires have been developed that have focused on both mindfulness as a trait and as a state measure, raising further confusions about the possibility to achieve an unequivocal definition of mindfulness (Davidson 2010; Williams 2010).

Quantitative Definitions of Mindfulness Within Modern Western Psychology

Mindfulness as a Single Faceted Trait

In stark contrast with the complex and multifaceted definitions of mindfulness employed by classical authors, several

of current mindfulness questionnaires suggest that mindfulness could be conceptualized as a single-faceted construct which main feature is “present-centred attention.” One of the first attempts to operationalize the construct of mindfulness brought to the development of the mindful attention awareness scale (MAAS) (Brown and Ryan 2003), which is currently one of the most widely employed questionnaires in mindfulness studies. The MAAS is a 15-item questionnaire, which items are scored on a 6-point Likert-type scale from 1 (almost always) to 6 (almost never). Inspiration for scale items came from several sources including authors’ personal experience and knowledge of mindfulness (and mindlessness), published writings on mindfulness and attention, and existing scales assessing conscious states of various kinds. Present-centered attention/awareness was, in the view of the authors, the main feature of mindfulness. To establish the validity of the MAAS, the authors tested whether the scale differentiated persons engaged in the cultivation of mindfulness from others (for instance, Zen meditators compared to age- and sex-matched controls). Moreover, they tested the relationship between mindfulness and well-being within an intervention paradigm in which changes in MAAS were used to predict changes in mood and stress among a sample of cancer patients addressed to MBSR. The authors reported internal consistency (coefficient alpha) of .82 and expected convergent and discriminant validity correlations. As an example, increases in mindfulness levels were positively correlated with many measures including, among others, openness to experience and well-being, and negatively correlated with further measures, such as rumination and social anxiety. In the group of cancer patients who completed the MBSR program, increases in MAAS scores were associated with decreases in mood disturbance and stress symptoms as well.

Note, however, that although the MAAS has been found valid and reliable from a psychometric point of view, the lack of an active control group to which subjects were randomly assigned did not allow to reach definitive conclusions as to whether increases in mindfulness levels were specifically attributable to mindfulness practice or to other nonspecific factors such as benefits’ expectation, group support, or even simple exposure to mindfulness terminology.

In a different study, Buchheld et al. (2001) investigated the validity of a questionnaire specifically concerned with the measurement of mindfulness among experienced meditators [the Freiburg Mindfulness Inventory (FMI)]. The measure was originally written in German and was later revised and translated into English (Walach et al. 2006). Unlike the development of the MAAS, the authors of the FMI mainly relied upon materials on Buddhism, insight meditation, and interviews with meditation experts to develop 38 test questions, which were later reduced to 30, 8 items being removed for inadequate correlation to the total scale

or excessive item difficulty. The measure was tested on a normative sample of 115 German-speaking individuals attending a Vipassana retreat. It showed internal consistencies of .93 and .94, respectively, in individuals who completed the inventory at the beginning and end of intensive meditation retreats. Although exploratory factor analyses suggested a four factor solution, the solution was somewhat unstable from pre- to postretreat and many items loaded on more than one factor. As a consequence, the authors suggested that the scale should be interpreted unidimensionally and they recommend the use of a single total score. Note, however, that although the FMI has been mainly derived from the literature and from expert statements (and, hence, it has validity contentwise), content validity is not necessarily sufficient to make a good measurement instrument. As an example, it could be the case that a perfectly valid instrument is still uncorrelated with specific changes in a MBI tested against an active control, simply because the supposedly specific MBI does something else than raise mindfulness.

In any case, more recently, Walach et al. (2006) provided further support to the reliability of the FMI by developing and testing a revised version of such questionnaire. Participants with meditation experience were recruited from Vipassana retreats. A clinical sample of 117 subjects and an even larger nonclinical sample were included as well. After removing items with low correlations with the overall scale, the authors created a short form with 14 items that appeared robust and statistically sound. More recent studies further confirmed and extended previous findings by showing that the instrument also conforms to conceptual assumptions of the measurement model (Sauer et al. 2011) and that, similarly to the original study, not only present moment awareness but also acceptance can be distinguished as different dimensions of mindfulness (Kohls et al. 2009). In sum, the results confirmed that participants who meditated regularly reported higher mindfulness scores than participants who meditated less or did not meditate ($p=.013$). FMI scores were also found to change significantly after meditation retreats. However, the authors cautioned that the FMI should be better used with expert meditators as the ambiguity of some questions could be misconstrued by nonmeditators and it could result in inaccurate scores (see below).

The Cognitive and Affective Mindfulness Scale (CAMS) Revised (Kumar et al. 2008) is a further 12-item inventory designed to measure attention, awareness, present-focus, and acceptance/non-judgment of thoughts and feelings in daily experience that was designed to improve the psychometric properties of the original CAMS (Feldman et al., unpublished manuscript). A sample of 548 university students was asked to rate the item pool as how much they felt each item related to them on a Likert-type scale from 1 (Rarely/Not at all) to 4 (Almost always). The sample was

split into two groups: sample 1, which was used to test the preliminary models, and sample 2, which was used to conduct a confirmatory factor analysis. The 12 items were found to have acceptable levels of internal consistency for both samples (sample 1, $\alpha=.74$; sample 2, $\alpha=.77$). Although such scale tries to distinguish several elements of mindfulness, it does not measure them separately but yields a single total score. Of note, expected correlations with a variety of other constructs were obtained.

Finally, the Southampton Mindfulness Questionnaire (SMQ) (Chadwick et al., unpublished manuscript) is a self-report measure with items scored on a 7-point Likert scale from 0 (disagree totally) to 6 (agree totally). The study exploring the psychometric properties of the SMQ suggested that the items represented four aspects of mindfulness, mindful observation, letting go, nonaversion, and nonjudgment. However, a unidimensional factor structure provided the best fit to their data as well. Furthermore, The SMQ detected differences between meditators and nonmeditators, as well as increases in mindfulness skills over the course of a mindfulness training and it was significantly correlated with mood rating.

Note, however, that although such instruments provide preliminary evidence to suggest that they could measure an overall mindfulness construct, significant methodological deficits limit the possibility to draw definitive conclusions about the specificity of questionnaires mentioned above. First of all, the use of a case-control design employed to compare expert meditators with gender- and age-matched nonmeditator controls does not allow to establish a causal effect between higher self-reported mindfulness levels in experts in comparison with controls. Alternative explanations could include higher pretraining mindfulness levels, as captured by current questionnaires, in subjects more prone to meditate, or a higher likelihood of perceiving oneself as mindful if one had applied significant strength and time in mindfulness practices.

Moreover, as reported above, the dearth of adequate active control groups to which subjects are randomly assigned does not allow to draw definitive conclusions as to whether changes in mindfulness levels observed following the completion of such mindfulness programs as MBSR are specifically attributable to training in mindfulness or to other nonspecific factors. It is worth mentioning, however, that since the publication of the original questionnaires, several studies have been published that suggest that mindfulness levels, as measured with these instruments, show a different pattern of change in subjects practicing mindfulness as compared with subjects practicing different trainings (e.g. Schmidt et al. 2011) or not practicing other forms of mental trainings (Holzel et al. 2010; Lynch et al. 2011).

Additionally, because the majority of information derives from nonclinical populations, it is difficult to draw definitive

conclusions as to whether data observed in healthy subjects can be generalized to clinical populations of patients or vice versa. Finally, the lack of follow-up data limits the possibility to understand the extent to which results observed in the short term are maintained in the long-term period as well and the relationship with the maintenance of formal and informal meditation practice.

Mindfulness as a Multifaceted Trait

At the opposite of previous studies, other authors suggested that any attempt to operationalize the construct of mindfulness into a single faceted construct does not take into account the complexity inherent into the original definition of mindfulness. According to such authors, multifaceted definitions of mindfulness might more properly take into account such a complexity. In an earlier study, Baer et al. (2004) investigated the validity of the Kentucky Inventory of Mindfulness Skills (KIMS), a 39-item instrument designed to measure four elements of mindfulness: observing, describing, acting with awareness, and accepting without judgment. Each item is rated on a 5-point Likert-type scale from 1 “never or rarely true” to 5 “almost always or always true.” The theoretical framework underpinning such questionnaire is largely based on the DBT conceptualization of mindfulness skills (Linehan 1993). In sum, the KIMS measures an overall tendency to be mindful in daily life and does not require experience with meditation. The 39-item final version of the KIMS was tested on a sample of 215 undergraduate psychology students at the University of Kentucky. A second sample included 26 adults diagnosed with borderline personality disorder who attended outpatient DBT programs. Internal consistencies of the four subscales ranged from .76 to .91. Exploratory and confirmatory factor analyses clearly supported the proposed four-factor structure and expected correlations with a variety of other constructs were obtained in both samples.

More recently, Baer et al. (2006) combined items from five different mindfulness self-report questionnaires. The factor-analytical analysis of responses to such questionnaires revealed a five-factor structure of mindfulness characterized by nonreactivity, observing, acting with awareness, describing, and nonjudging. The alpha values of each of these factors were as follows: nonreactivity=.75, observing=.83, acting with awareness=.87, describing=.91, and nonjudging=.87. When the authors tested the validity of this scale [Five Factors Mindfulness Questionnaire (FFMQ)], a hierarchical confirmatory factor analyses suggested that at least four (all aside from observe) of the identified factors were components of an overall mindfulness construct. Furthermore, the factor structure of mindfulness was found to vary with meditation experience. Furthermore, variations in three mindfulness facets (acting

with awareness, nonjudgement and nonreactivity) significantly predicted improvements in psychological outcomes. As a consequence, the authors suggested that MBIs should pay higher emphasis to such three facets. As for the MAAS, however, although the KIMS has been found valid and reliable from a psychometric point of view, the absence of a randomized comparison between subjects who underwent a MBI and those who did not does not allow to establish whether increases in mindfulness levels following a MBI are specific attributable to the intervention itself or depend on other nonspecific effects such as benefit's expectation and group support.

In spite of such limitations, however, a recent investigation performed by the same authors (Baer 2007) comparing long-term mindfulness meditators to nonmeditators partially confirmed and extended previous findings. The results of this study showed that three of the five facets (observing, nonjudging and nonreactivity) were especially helpful in understanding the changes that occur with the long-term practice of mindfulness meditation and in relating these facets to symptom reduction and improved psychological functioning.

More recently, Cardaciotto et al. (2008) provided a preliminary validation for a brief bidimensional measure of mindfulness [the Philadelphia Mindfulness Scale (PMS)] based on a further conceptualization of two key components of mindfulness, namely, present-moment awareness and acceptance, considered as separate and distinct constructs. Exploratory and confirmatory factor analyses supported a two-factor solution, corresponding to the two constituent components of the construct. Good internal consistency was demonstrated, and most relationships with other constructs were as expected. Note that the awareness and acceptance subscales were not correlated, suggesting that these two constructs can be examined independently and should be contemporary trained in order to avoid cases of individuals with high awareness and low acceptance or vice versa, related to a feeling of impotence or confusion respectively rather than of psychological well-being.

Of note, even though studies describing mindfulness as a multifaceted construct tend to suffer from the same methodological limitations of studies mentioned in the previous subsection, it is worth mentioning that a small number of well designed studies has recently reported that mindfulness levels could increase in subjects addressed to MBIs to a higher extent or in a different way than in those addressed to different active control conditions such as antidepressant medications (Kuyken et al. 2010) and cognitive therapy (Forman et al. 2007). As an example, Kuyken et al. (2010) compared the effects of MBCT+gradual discontinuation of antidepressant treatment vs. continuation of antidepressant treatment alone on several long-term outcomes. The results of their study suggested that MBCT was associated with

significantly greater improvement on mindfulness levels as compared with the control group. As a further example, Forman et al. (2007) randomly addressed 101 subjects experiencing anxiety or depression symptoms to classical cognitive therapy or ACT. The two groups of subjects did not differ at the end of treatment on measures of depression, anxiety, and distress. However, consistently with the hypothesized differential mechanisms of cognitive therapy and ACT, the authors observed that changes in "observing" and "describing" one's experiences (as measured with the KIMS) were more strongly associated with outcomes for those randomized to the cognitive therapy group, whereas acting with awareness and acceptance were more strongly associated with outcomes for those randomized to the ACT group.

In conclusion, most recent evidence suggests that mindfulness could also be described in terms of a multifaceted construct characterized by different features that include observing, acting with awareness, nonjudging, and nonreactivity (acceptance). However, aside from a few exceptions, better designed controlled studies are needed in order to distinguish between the specific and the nonspecific effects of MBIs on mindfulness levels and to investigate the long-term effects of mindfulness training.

Is Mindfulness a State, a Trait-Like Quality or Both?

In addition with the implicit assumption of questionnaires mentioned above investigating mindfulness as a trait-like quality, Lau et al. (2006) put forth that, on the basis of the original theory of Bishop et al. (2004), mindfulness can also be described as a mode, or state-like quality, that is maintained only when attention to experience is intentionally cultivated with an open, nonjudgmental orientation to experience. On account of these considerations, they developed a mindfulness questionnaire [the Toronto Mindfulness Scale (TMS)]. Such questionnaire assesses the subjective experience of a mindfulness state retrospectively in reference to mindfulness meditation techniques designed to evoke the mindfulness state. The scale was tested both in a sample of 158 subjects with no meditation experience and in a sample of 232 individuals with at least 8 weeks of daily meditation practice. Participants were instructed to pay attention to their breathing for 15 min and then complete the TMS. Results showed good internal consistency and showed that two factors, curiosity and decentering, were the key facets of mindfulness. Furthermore, the TMS scores increased with increasing mindfulness meditation experience. When criterion and incremental validity of the TMS were investigated in a group of individuals participating in 8-week MBSR programs, they showed that TMS scores increased following treatment, and decentering scores significantly predicted improvements in clinical outcomes. The authors, however,

underscored that their results did not provide complete support for the first component of the definition of Bishop et al. (2004), i.e., the active self-regulation of attention to immediate experience, pointing to the need for further research.

In conclusion, although the majority of current studies focused on the measurement of mindfulness as a trait-like quality, mindfulness can also be considered as a state that is maintained only when attention to experience is intentionally cultivated. It is noteworthy, however, that such two classifications of mindfulness are not mutually exclusive. Rather, the question is how mindfulness is conceptualized in a particular study and what instrument is used to address this issue. Indeed, some questionnaires are explicitly directed to measure trait-mindfulness, while others are used to measure state mindfulness. Of note, such observation is in line with the possibility that repeated brief mindfulness inductions could allow, over the long-term period, for increases in one's own dispositional (trait) levels of mindfulness.

Criticism to Current Definitions of Mindfulness

In spite of the increasing complexity and the good psychometrical properties of several of existing mindfulness questionnaires, several authors who are well-versed in classical conceptualizations of mindfulness have recently raised concerns that current instruments aimed at assessing mindfulness could represent significant misinterpretations of the original conceptualizations of mindfulness (Chambers et al. 2009; Grossman 2008; Rappay and Bystrisky 2009).

In a recent commentary, Grossman (2008) pointed out several critical issues including (1) the existence of serious conceptual difficulties and differences across different authors in the way mindfulness is understood and practiced; (2) the lack of an in-depth knowledge of Buddhist philosophy from which several modern MBIs are drawn in some of the developers of current psychometric approaches designed to measure mindfulness; (3) the “neglect of the possibly profound differences among respondents in semantic understanding of scale items...which seems to be fundamentally dependent on personal mindfulness practice”; (4) the discrepancy between how really mindful is a given individual and how much he/she thinks to be mindful; and (5) the significant biases that could exist between long-term mindfulness meditators and novice practitioners following brief MBIs such as MBSR and MBCT. In this section, I first discuss most important critical issues that are specific to mindfulness questionnaires, then I address most important critical issues that are more broadly related to psychometric testing in general.

First of all, defining mindfulness as “present-moment awareness of perceptible experience” might, at first glance,

seem a feasible approach to make the concept of mindfulness understandable to Western practitioners who are not familiar with such a concept. However, one should not forget that, according to classical literature, a long-term training, usually consisting of a large amount of mindfulness meditation practice, is required before an in-depth experience and understanding of mindfulness can be actually achieved (e.g., Gunaratana 2002; Thera 1973). Indeed, according to such perspective, only a highly refined training can allow for a proper understanding of mindfulness as an ongoing process involving different stages and features that include, among others, a deliberate open-hearted awareness of the unfolding of present moment perceptible experience, a process sustained by several qualities including acceptance, patience, and loving kindness, and a practice of nonanalytic investigation of ongoing experience (Bodhi 2000; Nanamoli and Bodhi 2000). More in detail, according to the classical perspective about mindfulness, such a concept cannot be fully separated by other related qualities such as the cultivation of knowledge, positive emotions, and even ethical behaviors related to the principle of doing no harm (e.g., Gunaratana 2002; Thera 1973). As a consequence, merely linear, additive models that sum putative markers of mindfulness could not suffice. Furthermore, any attempt to delineate discrete components of mindfulness is not likely to capture the inherent interrelationships among mindfulness and related concepts that are considered, according to the classical perspective of mindfulness, as synergistic and mutually reinforcing (Ivanovski and Malhi 2007).

In addition, according to Grossman (2008, 2011b), a large number of the developers of existing questionnaires about mindfulness lack sufficient knowledge about the original conceptualization and experience of mindfulness (e.g., Baer et al. 2004; Baer et al. 2006; Brown and Ryan 2003), and there is therefore the risk that such authors provide their own definitions of mindfulness rather than a definition of traditional mindfulness described in words understandable to most Western practitioners. This, in turn, might bias future research into mindfulness by narrowing the original perspective of mindfulness into a different perspective based on a small set of cognitive abilities that are, at least, representative of a few features of mindfulness (S.C. Hayes and Plumb 2007). As an example, there is currently general agreement on defining mindfulness as present-moment awareness/attention. However, according to the Buddhist interpretation, attention and awareness are part of any discriminative mental state (Dreyfus and Thompson 2008). Accordingly, they should at least be considered as aspects that serve as preconditions, rather than equivalents, of mindfulness. Furthermore, Western medical and psychological science has historically emphasized intellectual knowledge and concrete experience as the mainstream of human knowledge. On the other hand, the concept and the practice of

mindfulness derive from a culture that places higher emphasis upon subjective experience as a source of inquiry and understanding. To make the matter even more confusing, current evidence suggests that available questionnaires that are supposed to measure the same construct of mindfulness are often uncorrelated with one another or are correlated very modestly (Baer et al. 2006; Thompson and Waltz 2007). However, each quantification is referred to as though it uniquely and accurately measures a general construct of mindfulness (Grossman 2008).

Finally, if one more specifically focus on available questionnaires that are assumed to measure the concept of mindfulness, Grossman (2011a, 2011b) underscored that several of such questionnaires include or are completely based upon items that reflect the lack of mindfulness, i.e., mindlessness, rather than mindfulness itself (e.g., Baer et al. 2006; Brown and Ryan 2003). However, as the authors point out, asking people how often they drift off or do not pay attention, and then inverting their responses (e.g., “My mind doesn’t wander off very often,” that is, the low end of the scale) cannot be equated to something like “My mind stays focused on the task most of the time”). More broadly, the endorsement of the low end of a trait scale does not imply the strong presence of its opposite (Reise and Waller 2009). As an example, if one states he is not depressed, such a statement does not automatically implies that he is happy.

A psychometric questionnaires such as the MAAS that completely rely upon reverse-scored items might be especially problematic. First of all, according to the perspective mentioned above, the lack of mindlessness does not automatically imply the presence of mindfulness. Second, because noticing one’s own distractions implies a certain degree of attention, some authors have cautioned against the use of this instrument as a measure of mindfulness. Rather, they suggest that it could at least measure the extent to which an individual thinks he is able to notice one’s own lapses of attention (Carriere et al. 2008; Cheyne et al. 2006). Therefore, the actual risk is that an expert meditator that keeps his mind constantly focused on present moment experience might rate himself as mindful as an individual who is completely unaware that his mind is continuously wandering. An example of such a possibility has recently derived from two studies employing the FMI as a measure of one’s own perceived mindfulness levels in a sample of experienced meditators (Buchheld et al. 2001) and in a sample of drinking and nondrinking college students (Leigh et al. 2005). The combined results of such two studies suggested that binge drinking students rated themselves as more mindful than expert meditators (Grossman 2011b).

Further critical issues, although not specific to the mindfulness construct, concern psychometric testing in general. In the following part of this section, I will show how such general issues might bias the interpretation of findings

reported in mindfulness questionnaires. First of all, an important consequence of the notion that an in-depth understanding of mindfulness is largely thought to derive from a long-term and highly reified mindfulness training is a great risk that the words and phrases in inventory items may be very differently understood depending on whether one has ever meditated, as well as on the extent of meditation experience (Gunaratana 2002; Thera 1973). This phenomenon is consistent with the “response shift,” a well-known phenomenon in psychometric literature that refers to the fact that practicing something or experiencing something changes internal standards which experiences are compared against. (Howard et al. 1979). Grossman brings the example of the act of “noticing” included in a popular questionnaire aimed at measuring mindfulness levels (Grossman 2008). At a very basic level, each individual is supposed to be able to notice one’s own sensations (Kang and Whittingham 2010). However, such an ability usually represents only the most gross level of noticing something. Such a level is probably quite different from the way in which a well-trained mindfulness practitioner could interpret the act of noticing. A well-trained mindfulness practitioner might, as an instance, understand the act of “noticing” as an intentional attending to the moment-to-moment experience of doing something in an open, nonjudgmental manner, observing the changing flow of sensations, thoughts, and/or emotional states as they arise and they disappear moment by moment. Similarly to the example of “noticing,” a large amount of terms usually employed by questionnaires purporting to measure mindfulness including “awareness,” “paying attention,” and “non-judging” might be very differently interpreted across mindfulness meditators and nonmeditators and even across meditators with little meditation experience in comparison with meditators with higher meditation experience (Grossman 2008).

Furthermore, a more fundamental critical issue concerning the difficulty inherent in any attempt to measure mindfulness levels (as well as any other attempt to measure different psychological constructs) is the possibility that, as no set of behaviors or physiological patterns have yet been documented to be specific to mindfulness, it is difficult to ascertain the extent to which there is concordance between how mindful an individual thinks he is and/or say he is, and his “true” levels of mindfulness. Several systematic methodological issues that include, for instance, the social desirability bias and cognitive dissonance could bias this approach. Pertaining to social desirability, it is reasonable to think that because all available mindfulness inventories employ concepts plainly recognizable to those exposed to mindfulness practices as characteristic of the stages or goals of training, subjects who participated in a MBI probably know what the “right answer” is. Furthermore, as such participants have invested time and strength into the mindfulness program, they could be more likely to

describe themselves as more mindful at the end of the mindfulness program as compared with how mindful they rated themselves at the beginning of the program (Grossman 2008). An example of such a possibility comes from psychotherapy studies suggesting that, although clients of psychotherapists randomized to a mindfulness meditation program (which is supposed to enhance mindfulness levels) in addition to their standard training achieved better outcomes in comparison with those randomized to psychotherapists who were randomized to the standard training alone in one study (Grepmaier et al. 2007), in a different study clients of psychotherapists who rated themselves as more mindful achieved lower benefits from treatment in comparison with those assigned to psychotherapists who perceived themselves as less mindful (Stanley et al. 2006).

On the other hand, one should not forget that to be able to operationalize mindfulness to some useful and valid, and psychometrically sound degree is a good achievement that should not be held against the ideal. Ideals are ideals because they cannot be reached, yet the striving to reach them constitutes scientific progress. And as such, even though the measurement of mindfulness falls very short of the ideal, if existing questionnaires are considered taking into account the issues mentioned above, they could be considered as a first important step towards the achievement of the possibility to “capture” the original construct of mindfulness within modern Western psychological theoretical frameworks.

Suggestions for Future Research

If one takes into account the several critical issues mentioned above, the difficulty inherent in any attempt to provide an unequivocally defined operational definition of mindfulness that is in line with the original conceptualizations of mindfulness becomes evident. As the field of mindfulness is rapidly growing, it will become increasingly important to achieve a more unitary consensus of what mindfulness is and what it is not. Furthermore, along with clinical studies aimed at assessing the efficacy of available MBIs for a large variety of clinical and nonclinical conditions, it will become increasingly important to understand the limits of existing questionnaires aimed at assessing mindfulness and provide alternative solutions that could reduce current confusion into mindfulness (Grossman 2011a,b; Rappay and Bystrisky 2009).

Of note, the following list does not pretend to be exhaustive, and further alternatives might be explored by means of a more in-depth dialogue between Western researchers concerned with the topic of mindfulness and Eastern and Western long-term mindfulness meditation practitioners. First of all, existing questionnaires that are currently referred

to as mindfulness questionnaires could be better relabeled in terms of a clear description of the psychological characteristics they actually assess. As an example, Grossman (2011a) suggests that the MAAS could be better relabeled as a questionnaire aimed at exploring “experienced lapses of attention.” Similarly, the FFMQ could be relabeled as a questionnaire aimed at exploring five self-attributed psychological qualities rather than mindfulness. In line with such a view, several questionnaires have been recently developed that are specifically designed to measure constructs that, although could share some similarities with the Buddhist concept of mindfulness, are explicitly described as different from traditional conceptualizations of mindfulness. One such example involves the investigation of the construct of “decentering” and its relationship with relapses in patients suffering from major depression (Fresco et al. 2007). This, in turn, could reduce current confusion related to the tendency of defining mindfulness all such constructs as acceptance, attention, awareness, and nonjudgment that share, at best, some similarity with the original conceptualization of mindfulness.

Second, new self-reports could be developed that measure not the extent to which respondents think they are skilled in specific characteristics or behaviors but the extent to which they value those characteristics or behaviors, such as attending to present moment experience (Grossman 2011a, 2011b). Such an investigation could, in turn, shed light on how mindfulness practice is associated with differences or changes in one’s own value system. Furthermore, they could provide insights about what is important to people who practice/are interested into mindfulness practice and those who are not and they could help researchers understand how mindfulness practice influences people’s perspectives on life and values.

Third, because according to classical literature about mindfulness, the concept of mindfulness cannot be fully separated by several related qualities such as equanimity, wisdom, compassion, concentration, and many others, it could be important to more deeply focus on such characteristics that could be more easily captured by self-report questionnaires in comparison with the concept of mindfulness. Although the investigation of several of these concepts could still suffer from some of the difficulties inherent in the attempt to measure mindfulness, it might offer an alternative approach to the measurement of mindfulness itself while providing empirical evidence for the psychological consequences of mindfulness training on several key qualities that have been highly regarded by traditional mindfulness lineages.

Furthermore, more consistent effort should be paid to the investigation of the behavioral, neuropsychological, and neurobiological changes that accompany mindfulness practice. Although such an approach does not clearly allow for a

proper understanding of what mindfulness is or it is not, it could allow for a better understanding of the differences existing between such correlates in subjects who practice mindfulness in comparison with subjects who practice different psychological trainings such as relaxation or concentrative meditation or do not practice any form of mental training (Chiesa et al. 2011a,b). As an example, higher emphasis could be placed upon the extent to which mindfulness practitioners differ from practitioners of different approaches (such as relaxation training or concentrative meditation) in terms of (a) attentional measures (Chiesa et al. 2011b), (b) body awareness (e.g., the sensitivity to detect one's own physical sensations in a given part of the body) that, in turn, has been associated with several qualities that are emphasized by traditional mindfulness trainings such as empathy (Lutz et al. 2008), (c) emotional regulation, such as the possibility to reduce emotional interference (e.g., Ortner et al. 2007), and (d) changes in the perspective of the self (for a more detailed overview, see Hölzel et al. 2011). In line with the latter issue, note also that recent research has identified a default-mode network (DMN) of brain regions active when the brain is not engaged in task-induced activity and that has been significantly involved in one's own sense of self (Buckner and Vincent 2007; Gusnard et al. 2001). An increasing number of studies have recently shown that meditators engaged in both concentration and mindfulness meditation practices showed reduced activation of the DMN while meditating (e.g. Brewer et al. 2011; Hasenkamp et al. 2012; Pagnoni et al. 2008). As a consequence, a fruitful avenue for future research on the objective correlates of mindfulness or, at least, of the lack of mindfulness, i.e., mindlessness, could be the investigation of the neural activation in the DMN in mindfulness practitioners compared with concentrative meditation practitioners and nonpractitioners. On the other hand, it is important to underscore that neuro-scientific and neuro-psychological findings, which in their generalization and their artificial nature are currently grossly overestimated against clinical findings or self-reports, should not be considered as alternative to self reports of mindfulness but rather as a complementary way to investigate the correlates of practicing mindfulness.

Finally, greater emphasis could be placed upon qualitative investigations and research employing interview methods (Grossman 2011a, 2011b). An example of such an approach can be found in a recent study by Hargus et al. (Hargus et al. 2010) where the authors invited depressed subjects, all of whom had experienced suicidal crises, to describe with an open-ended approach warning signs for their last crisis. Participants' answers were then blind-rated for measures of meta-awareness and memory specificity (Hargus et al. 2010). As a further example, several qualitative studies have recently been published that asked participants to state what was more important to them during the

mindfulness program by means of questions, such as "What effects, if any, have you noticed since joining the MBSR group? What role does mindfulness-based practice play in your diagnosis/treatment/recovery?" (e.g., Fitzpatrick et al. 2010; Mackenzie et al. 2007). Indeed, these methods, largely based on open-ended approaches, could provide greater insights into the psychological experience of mindfulness practitioners in comparison with a small set of closed-questions and might lead to the development of new, not yet considered, categories of psychological effects associated with mindfulness training.

Conclusion

In conclusion, according to classical literature, the concept of mindfulness cannot be properly understood without an in-depth training, and it is very difficult to disentangle the concept of mindfulness from mutually related concepts such as wisdom, equanimity and ethics. According to authors well versed in the original Buddhist literature, from which several MBIs are overtly or implicitly derived, modern attempts to operationalize mindfulness have consistently failed to provide an unequivocal definition of mindfulness which takes into account the complexity of the original definitions of mindfulness. Time and effort are probably required to integrate Western evidence-based psychological tradition with a Buddhist phenomenological orientation based upon a systematic investigation of subjective experience. Probably, a more in-depth dialogue between Western researchers concerned with the topic of mindfulness and Eastern and Western long-term mindfulness meditation practitioners will be needed before advances into the understanding of mindfulness within Western psychological theoretical frameworks will be achieved.

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