

Mindfulness: A Proposed Operational Definition

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Abstract

There has been substantial interest in ‘mindfulness’ as an approach to reduce cognitive vulnerability to stress and emotional distress in recent years. However, thus far mindfulness has not been operationally defined. This paper describes the results of recent meetings held to establish a consensus on mindfulness and to conjointly develop a testable operational definition. We propose a two-component model of mindfulness and specify each component in terms of specific behaviours, experiential manifestations, and implicated psychological processes. We then address issues regarding temporal stability and situational specificity and speculate on the conceptual and operational distinctiveness of mindfulness. We conclude this paper by discussing implications for instrument development and briefly describe our own approach to measurement.

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In the last 20 years, 'mindfulness' has become the focus of considerable attention by a large community of clinicians, and to a less extent, empirical psychology. Mindfulness has been described as a process of bringing a certain quality of attention to moment-by-moment experience (Kabat-Zinn, 1990). The capacity to evoke mindfulness is ostensibly developed using various meditation techniques that originate from Buddhist spiritual practices (Hahn, 1976). Mindfulness in Buddhist traditions occupies a central pole in a system that was developed as a path leading to the cessation of personal suffering (Thera, 1962; Silananda, 1990). Mindfulness in contemporary psychology has been adopted as an approach to increasing awareness and skillful responding to mental processes that contributes to emotional distress and maladaptive behaviour.

Much of the interest in the clinical applications of mindfulness has been sparked by the introduction of Mindfulness-Based Stress Reduction (MBSR), a manualized treatment program originally developed for the management of chronic pain (Kabat-Zinn, 1982; Kabat-Zinn, Lipworth & Burney, 1985; Kabat-Zinn, Lipworth, Burney & Sellers, 1987). MBSR is now used widely to reduce psychological morbidity associated with chronic illnesses and as a treatment for emotional and behavioural disorders (Kabat-Zinn, 1998). Although the popularity of MBSR has grown in the absence of rigorous evaluation (Bishop, 2002), randomized controlled trials are beginning to emerge. The findings are encouraging with recent controlled trials showing impressive reductions in psychological morbidity associated with medical illness (Reibel, Greenson, Brainard & Rosenzweig, 2001; Speca, Carlson, Goodey & Angen, 2000; Carlson, Ursuliak, Goodey, Angen, & Speca, M., 2001) and mitigation of stress and enhanced emotional well-being in non-clinical samples (Astin, 1997; Shapiro, Schwartz & Bonner, 1998; Williams, Kolar, Reger & Pearson, 2001).

Recent innovations in psychological treatment have also seen an increase in the use of mindfulness approaches. Dialectical behavior therapy (Linehan, 1993), an approach that has been shown to reduce self-mutilation and suicidal behaviour in chronically suicidal patients with borderline personality disorder (Linehan, Armstrong, Saurez, Allmon, & Heard, 1991), provides training in mindfulness meditation to foster improvements in affect tolerance. Mindfulness-Based Cognitive Therapy (Segal, Williams & Teasdale, 2002) combines training in mindfulness meditation with cognitive therapy. A large multi-site randomized controlled trial has shown that this combined approach can significantly reduce the rate of relapse in recurrent major depression (Teasdale, Segal, Williams, Ridgeway, Soulsby & Lau, 2000). Several other investigators have provided theoretical rationales for integrating mindfulness approaches into the treatment of a range of clinical syndromes including generalized anxiety disorder (e.g., Roemer & Orsillo, 2002; Wells, 1999; 2002), post-traumatic stress disorder (Wolfsdorf & Zlotnick, 2001), substance abuse (Marlat, 2002; Breslin, Zack, & McMMain, 2002) and eating disorders (Kristheller & Hallett, 1999; Telch, Agras, & Linehan, 2001).

These approaches involve a rigorous program of training in meditation to cultivate the capacity to evoke and apply mindfulness to enhance emotional well-being and mental health. Mindfulness approaches are not considered relaxation or mood management techniques however, but rather a form of *mental training* to reduce cognitive vulnerability to reactive modes of mind that might otherwise heighten stress and emotional distress, or that may otherwise perpetuate psychopathology.¹ The cultivation and practice of mindfulness through this program

¹ Discussions of this approach carefully discriminate between ‘mindfulness meditation’ and ‘concentration’ forms of meditation that induce deep states of relaxation. Concentration meditation involves restricting the focus of attention to a single stimulus such as a word, sound or sensation. When attention wanders, it is redirected back to that single stimulus. No attention is paid to the nature of the distraction. In contrast, mindfulness meditation involves observation of constantly changing internal and external stimuli as they arise. An excellent scholarly discussion of the differences in the goals and methods of these major classes of meditation techniques can be found in Naranjo & Ornstein (1971).

of mental training is thus thought to mediate observed effects on mood and behaviour (Kabat-Zinn, 1990) but these speculations remain yet untested and thus unsubstantiated.

Although mindfulness has been described by a number of investigators (Kabat-Zinn, 1990, 1998; Shapiro & Swartz, 1999, 2000; Teasdale, 1999b; Segal et al., 2002), the field has thus far proceeded in the absence of an operational definition (Bishop, 2002). There have been no systematic efforts to establish the defining criteria of its various components or to specify implicated psychological processes, and general descriptions of mindfulness have not been entirely consistent across investigators. As long as fundamental questions concerning construct specificity and operational definitions remain unaddressed it is not possible to undertake important investigations into the mediating role and mechanisms of action of mindfulness, or to develop instruments that allow such investigations to proceed. Thus we must move toward a definition that is more precise and that specifies testable theoretical predictions for the purpose of validation and refinement.

In response to this need for greater precision and specificity, a series of meetings were held to establish a consensus on the various components of mindfulness, to conjointly develop operational definitions, and to generate testable predictions for validation. This paper presents the consensus emerging from those meetings. The overall goal is produce an operational definition that, as a starting point, can be adopted by the field. We propose this operational definition in the hopes that it will stimulate investigation and theoretical development so that we can have a better understanding of mindfulness and mindfulness approaches to psychological treatment.

Methods for Elicitation and Description of the Phenomenon

Although various meditation practices are taught in mindfulness approaches to treatment, they are similar in their basic procedures and goals. A description of sitting meditation will illustrate the basic approach. The client maintains an upright sitting posture, either in a chair or cross-legged on the floor, and attempts to maintain attention on a particular focus, most commonly the somatic sensations of his or her own breathing. Whenever attention wanders from the breath to inevitable thoughts and feelings that arise, the client will simply take notice of them and then let them go as attention is returned to the breath. This process is repeated each time that attention wanders away from the breath. As sitting meditation is practiced, there is an emphasis on simply taking notice of whatever the mind happens to wander to and accepting each object² without making judgments about it, elaborating on its implications, additional meanings, or need for action (Kabat-Zinn, 1990; Segal et al., 2002). The client is further encouraged to use the same general approach outside of his or her formal meditation practice as much as possible by bringing awareness back to the here and now during the course of their day, using the breath as an anchor, whenever they notice that their attention has become focused on streams of thoughts, worries or ruminations, or a general lack of awareness.

These procedures ostensibly lead to a state of mindfulness. Broadly conceptualized, mindfulness has been described as a kind of non-elaborative, non-judgmental, present-centered awareness in which each thought, feeling or sensation that arises in the attentional field is acknowledged and accepted as it is (Kabat-Zinn, 1990, 1998; Shapiro & Schwartz, 1999, 2000; Teasdale, 1999b; Segal et al., 2002). In a state of mindfulness, thoughts and feelings are observed as events in the mind, without over-identifying with them, and without reacting to them

² We use the term object to refer to any stimulus that attention might become involved with including sensations, thoughts and feelings as well as environmental stimuli such as sounds.

in an automatic, habitual pattern of reactivity. This dispassionate state of self-observation is thought to introduce a 'space' between one's perception and response. Thus mindfulness is thought to enable one to respond to situations more reflectively (as opposed to reflexively).

Our Consensus on an Operational Definition

We propose a two-component model of mindfulness. The first component involves the self-regulation of attention so that it is maintained on immediate experience, thereby allowing for increased recognition of mental events in the present moment. The second component involves adopting a particular orientation toward one's experiences in the present moment, an orientation that is characterized by curiosity, openness and acceptance. We will now describe each component in terms of behavioural and experiential features and in terms of the implicated psychological processes.

Self-Regulation of Attention

Mindfulness begins by bringing awareness to current experience - observing and attending to the changing field of thoughts, feelings and sensations from moment to moment - by regulating the focus of attention. This leads to a feeling of being very alert to what is occurring in the here and now. It is often described as a feeling of being fully present and alive in the moment. Skills in *sustained attention* would be required to maintain an awareness of current experience. Sustained attention refers to the ability to maintain a state of vigilance over prolonged periods of time (Parasuraman, 1998; Posner & Rothbart, 1991). Sustained attention on the breath thus keeps attention anchored in current experience so that thoughts, feelings and sensations can be detected as they arise in the stream of consciousness. Skills in *switching* allow the student to bring attention back to the breath once a thought, feeling or sensation has been acknowledged. Switching involves flexibility of attention so that one can shift the focus from

one object to another (Jersild, 1927; Posner, 1980). Thus one of the predictions of this model is that the development of mindfulness would be associated with improvements in sustained attention and switching, which can be objectively measured using standard vigilance tests (e.g., Klee & Garfinkel, 1983) and tasks that require shifting mental set (Rogers & Monsell, 1995), respectively.

The self-regulation of attention also fosters non-elaborative awareness of thoughts, feelings and sensations as they arise. Rather than getting caught up in ruminative, elaborative thought streams *about* one's experience, its origins, implications and associations, mindfulness involves a direct *experience of* events in the mind and body (Teasdale et al., 1994). Note that mindfulness is not a practice in thought suppression; all thoughts or events are considered an object of observation, not a distraction. However, once acknowledged, attention is directed back to the breath thus preventing further elaboration. This is thought to *inhibit secondary elaborative processing* of the thoughts, feelings and sensations that arise in the stream of consciousness. Thus, mindfulness practices are thought to be associated with improvements in cognitive inhibition, particularly at the level of stimulus selection. This can be objectively measured using tasks that require the inhibition of semantic processing (e.g., emotional Stroop: Williams, Mathews, & MacLeod, 1996).

Furthermore, because attention has a limited capacity (Schneider & Shiffrin, 1977), when it is released from elaborative thinking more resources are made available to process information related to current experience. This increases access to information that might otherwise remain outside awareness resulting in a wider perspective on experience. Rather than observing experience through the filter of our beliefs, assumptions, expectations and desires, mindfulness involves a direct observation of various objects as if for the first time, a quality that is often

referred to as ‘beginners mind.’ This ability can be measured on tasks in which successful performance depends on detecting stimuli in unexpected settings (e.g., Henderson, Weeks, & Hollingworth, 1999). The prediction is that mindfulness practice should facilitate identification of objects in unexpected contexts because one would not bring preconceived beliefs about what should or should not be present.

In summary, we propose that mindfulness can be defined, in part, as the self-regulation of attention, which involves sustained attention, attention switching, and inhibition of elaborative processing. In this context, mindfulness can be considered a metacognitive skill (cognition about one’s cognition, Flavell, 1979). Metacognition is thought to consist of two related processes - monitoring and control (Nelson, Stuart, Howard, & Crowley, 1999; Schraw & Moshman, 1995). The notion of mindfulness as a metacognitive process is implicit in the operational definition that we are proposing since its evocation would require both control of cognitive processes (i.e., attention self-regulation) and monitoring the stream of consciousness as is explicated more fully below.

Orientation to Experience

Mindfulness is further defined by an orientation to experience that is adopted and cultivated in mindfulness meditation practices. This orientation begins with making a commitment to maintain an attitude of curiosity about where the mind wanders whenever it inevitably drifts away from the breath, as well as curiosity about the different objects within one’s experience at any moment. All thoughts, feelings and sensations that arise are initially seen as relevant, and therefore, subject to observation. The client is thus not trying to produce a particular state, such as relaxation, or change what he or she is feeling in any way. Rather, the

client is instructed to make an effort to just take notice of each thought, feeling and sensation that arises in the stream of consciousness.

In this manner, a stance of acceptance is taken toward each moment of one's experience. Acceptance is defined as being experientially open to the reality of the present moment (Roemer & Orsillo, 2002). It involves a conscious decision to abandon one's agenda to have a different experience and an active process of 'allowing' current thoughts, feelings and sensations (Hayes, Strosahl & Willson, 1999). It is an active process in that the client chooses to take what is offered with an attitude of openness and receptivity to whatever happens to occur in the field of awareness. Thus mindfulness can be conceptualized as a process of relating openly with experience.

There are several predictions based on this model. First, adopting a stance of curiosity and acceptance during mindfulness practices should eventually lead to reductions in the use of cognitive and behavioural strategies to avoid aspects of experience. Measures of repressive coping style (e.g., Miller Behavioural Style Scale; Miller, 1980; Miller & Mangan, 1983), as well as more general coping measures (e.g., Ways of Coping Questionnaire; Folkman & Lazarus, 1988), may have some utility to test this prediction. Also, with time, the practice of mindfulness would likely increase dispositional openness, a trait that is characterized by curiosity and receptivity to new experiences (Costa & McCrae, 1987). Further, adopting a stance of acceptance toward painful or unpleasant thoughts and feelings would be expected to change the psychological context in which those objects are now experienced (see Hayes, Wilson, Gifford, Follette, & Strosahl, 1996; Hayes et al., 1999). In essence, emotional distress would be experienced as less unpleasant and threatening since the context of acceptance changes their

subjective meaning. This would likely lead to improved affect tolerance, which can be measured with proximate measures such as the Anxiety Sensitivity Index (Peterson & Reiss, 1992, 1993).

Approaching one's experience with an orientation of curiosity and acceptance, regardless of valence or desirability, sets the stage for intensive self-observation. Mindfulness can thus be further conceptualized as a process of investigative awareness that involves observing the ever-changing flow of private experience. The term 'investigative' refers to an intentional effort to observe and gain a greater understanding of the nature of thoughts and feelings. The client is instructed to make an effort to notice each object in the stream of consciousness (e.g., a feeling), to discriminate between different elements of experience (e.g., an emotional "feeling" sensation from a physical "touch" sensation) and observe how one experience gives rise to another (e.g., a feeling evoking a judgmental thought, and then, the judgmental thought heightening the unpleasantness of the feeling).

Monitoring of the stream of consciousness in this manner over time would likely lead to increased cognitive complexity as reflected by an ability to generate differentiated and integrated representations of cognitive and affective experience. For example, the development of mindfulness would likely result in a greater capacity to distinguish feelings from bodily sensations unrelated to emotional arousal and to understand and describe the complex nature of emotional states. Thus, mindfulness would be positively correlated with measures of emotional awareness (e.g., Levels of Emotional Awareness Scale; Lane, Quinlan, Swartz, Walker & Zeitlin, 1990) and negatively correlated with measures of alexithymia (e.g., Toronto Alexithymia Scale; Bagby, Parker & Taylor, 1994). Similarly, the development of mindfulness would likely be associated with a greater capacity to see relationships between thoughts, feelings and actions and to discern the meanings and causes of experience and behaviour. Thus mindfulness would

be positively correlated with measures of psychological mindedness (e.g., Psychological Mindedness Scale; Conte & Ratto, 1997).

Further, mindfulness practices provide opportunities to gain insight into the nature of thoughts and feelings as passing events in the mind rather than inherent aspects of the self or valid reflections on reality (Teasdale et al., 1995; Teasdale, 1999a, 1999b; Segal et al., 2002). Coding procedures used to assess the complexity of cognitive representations in self-narratives (e.g., Labouvie-Vief, Chiodo, Goguen, Diehl & Orwoll, 1995) and autobiographical recall (e.g., Moore, Hayhurst & Teasdale, 1996) would be useful paradigms to test these hypotheses. Mindfulness would likely be associated with more complex descriptions of one's thoughts as contextual, relativistic, transient and subjective and there is now some evidence to support this hypothesis (Teasdale, Moore, Hayhurst, Pope, Williams & Segal, 2002).

In summary, we see mindfulness as a process of regulating attention to bring a quality of non-elaborative awareness to current experience and a quality of relating to one's experience within an orientation of curiosity, experiential openness and acceptance. We further see mindfulness as a process of gaining *insight* into the nature of one's mind and the adoption of a de-centered perspective (Safran & Segal, 1990) on thoughts and feelings so that they can be experienced in terms of their subjectivity (versus their necessary validity) and transient nature (versus their permanence).

Temporal Stability and Situational Specificity

We propose that mindfulness is a mode of awareness that is evoked when attention is regulated in the manner described. We use the term 'mode' to refer to a state-like quality. We prefer the term 'mode' to 'state.' The term 'mode' is defined as "the manner or way in which a thing is done" (Oxford English Dictionary, 2nd Edition, 1989). This definition captures our belief

that mindfulness is a psychological process. Mindfulness is therefore similar to a skill that can be developed with practice. We see it as much closer to a state than a trait because we believe that its evocation and maintenance is dependent on the regulation of attention while cultivating an open orientation to experience. As long as attention is purposely brought to experience in the manner described, mindfulness will be maintained, and when attention is no longer regulated in this manner, mindfulness will cease.

Although mindfulness-based interventions rely on meditation techniques to teach the necessary skills for evoking mindfulness, we hypothesize that this mode of awareness is not limited to meditation. Once the skills are learned, attention can be regulated to evoke mindfulness in many situations thus allowing the student to skillfully respond to situations that provoke emotional reactions. Further, there has been some speculation that effective psychotherapy may also enhance the capacity to evoke and utilize mindfulness to gain insight and alternate responses to subjective inner experiences (e.g., Martin, 1997; 2002; Horowitz, 2002; Muran, 2002). If mindfulness is indeed a mode of awareness that can be developed as part of the process of psychotherapy, then the theoretical and heuristic value of the operational definition that we are proposing may not be limited only to meditation-based interventions, but may make important contributions to the psychotherapy outcome literature as well.

Alternative Conceptualizations

While the operational definition that we propose is consistent with the general descriptions of mindfulness in the literature, there have been a number of other qualities or components discussed that we have not included in our own definition. In our view, many of the qualities or components that have been discussed are more likely *outcomes* of having learned mindfulness skills, or maintained a mindfulness practice over time, rather than implicit in the

construct. Most notably, mindfulness has been previously described as embodying qualities such as patience (allowing things to unfold in their own time), trust (confidence in the ability to stay in contact with private experience), non-reactivity (calmness), wisdom (self-knowledge) and compassion (empathy for oneself) (e.g., Kabat-Zinn, 1990, 1998; Shapiro & Swartz, 1999, 2000; Reibel et al., 2001). In addition to the theoretical importance of separating the central features of mindfulness from common correlates, at a pragmatic level a definition that confounds operational features with potential benefits reduces the utility of the construct.

Conceptual and Operational Distinctiveness

There are a number of constructs that may be within the same general domain as mindfulness as elicited by mindfulness meditation techniques. Most notably is Ellen Langer's work in social psychology on mindfulness as a creative cognitive process. While both constructs involve attentional engagement, we agree with Langer that her construct is quite different from mindfulness as described in the context of the mindfulness meditation techniques (see Langer, 1989). Langer's mindfulness involves the active construction of new categories and meanings when one pays attention to the stimulus properties of primarily *external* situations, while our own definition emphasizes the inhibition of such elaborative processes as one pays attention to primarily *internal* stimuli (thoughts, feelings and sensations). Other similar constructs that might fall within the same general domain of mindfulness include flow (Csikszentmihalyi, 1997) and absorption (Tellegan & Atkinson, 1974).

We also see mindfulness within the general domain of constructs that describe the ability to observe the temporal stream of thoughts and feelings including *introspection* (James, 1890), *observing self* (Deikman, 1982), *presence* (Bugental, 1987), *reflective functioning* (Fonagy & Target, 1996; 1997) and *deautomatization/decentering* (Safran and Segal, 1990). Although these

various constructs have not always been well developed conceptually, and few have been explicitly operationalized, each has generally been described as a process of stepping outside of the automated mode of perceptual processing and attending to the minute details of mental activity that might otherwise escape awareness. These constructs are also variously described as a process of ‘freeing up of attention’ so that it is non-biased and exploratory (see Martin, 1997). Other related constructs, variously labeled *psychological mindedness* (Conte & Ratto, 1997; McCallum & Piper, 1987), *insight* (Tolor & Reznikoff, 1960) and *self-awareness* (Fingarette, 1963), deal more with the capacity to see relationships among thoughts, feelings and actions, and to understand the meanings and causes of experiences and behaviour. Although these latter constructs also involve self-observation, they emphasize the ability to construct increasingly complex mental representations of one’s own (and possibly, others’) mind and behaviour.

Mindfulness, as we have defined it, is likely much closer conceptually and operationally to those constructs that involve a *process* of self-observation (i.e., introspection, observing self, reflective functioning) than self-knowledge per se (i.e., psychological mindedness, insight and self-awareness). Those that involve self-knowledge likely reflect the *outcome* of practicing many forms of intensive self-observation over time, whether from a daily practice of meditation or from psychotherapy, and are therefore probably distinct from the methods used to obtain them.

Yet the definition of mindfulness that we are proposing describes a quality of self-focused attention characterized by openness and acceptance of experience that is not articulated in the descriptions of these other constructs involving self-observation. This distinction is important because there is considerable evidence that certain forms of self-focused attention can exacerbate distress and heighten or maintain psychopathology (e.g., Pyszczynski & Greenberg,

1987; Nolen-Hoeksema, 1991), while other modes of awareness lead to a more adaptive self-focused style (Trapnell & Campbell, 1999). The question of whether mindfulness is distinct from these other constructs is ultimately an empirical one. However, we do not currently see mindfulness as redundant with other constructs describing intentional self-focused attention.

Broadening the Conceptual Model

Situating mindfulness within a more elaborated conceptual model will further elucidate the central features of this construct as it is applied in clinical practice. Our conceptualization draws heavily on self-regulation models of cognition and mood (Carver & Scheier, 1981; 1990) and contemporary cognitive models of psychopathology. Although speculative, we feel that this kind of theorizing is necessary but neglected in discussions of mindfulness.

According to a self-regulation model, much of cognition occurs in the service of goals. We are constantly engaged in a process of comparing *what is* with what is *desired* and much of our mental life and behavioural organization functions in the service of reducing any discrepancies (Miller, Galanter & Pribraum, 1960; Powers, 1973; Carver & Scheier, 1981; 1990). When there is a discrepancy, negative affect occurs (e.g., fear, frustration) setting in motion cognitive and behavioural sequences in an attempt to move the current state of affairs closer to one's goals, desires and preferences (Carver & Scheier, 1990). If the discrepancy is reduced, then the mind can exit this mode and a feeling of well-being will follow until another discrepancy is detected again setting this sequence in motion.

When goals cannot be met, and especially if the goal is afforded high value, then the mind will continue to dwell on the discrepancy and search for possible ways to reduce it giving rise to rumination (Martin & Tesser, 1996). Rumination appears to play a central role in exacerbating negative affect. For example, the tendency to worry seems to reflect attempts to

plan for and develop potential strategies for avoiding anticipated future negative events, but can lead to the maintenance or heightening of anxiety (Borkovec, Shadick & Hopkins, 1991; Wells, 1999). Similarly, depressive rumination appears to reflect attempts to change aspects of one's assumed basic faults (Nolen-Hoeksema, 1991), or alternately, to regain something that has been lost and is of central importance to the person's sense of identity or worth (Pyszczynski & Greenberg; 1987). It is now well established that these patterns of ruminative thinking can escalate a spiraling cycle of dysphoric affect that can lead eventually to a major depressive episode (Pyszczynski & Greenberg; 1987; Teasdale & Bernard, 1993; Nolen-Hoeksema, 1991). It is also assumed that rumination will continue until the person either satisfies or gives up the goal (Martin & Tesser, 1989). Thus disengaging from one's goals should facilitate the release from ruminative thinking and thus reduce cognitive vulnerability to certain forms of psychopathology.

As discussed, mindfulness approaches teach the client to become more aware of thoughts and feelings and to relate to them in a wider, decentered, perspective as transient mental events rather than reflections of the self or necessarily accurate reflections on reality. Thus, if self-devaluative, hopeless thoughts are recognized as simply thoughts, the student will be better able to disengage from them since no action will be required (i.e., since the thoughts are not 'real' there is no goal to obtain and thus no need to ruminate to find a solution). The reduction in ruminative thinking that is predicted to occur by adopting a decentered perspective might explain why mindfulness training reduces the risk of relapse in recurrent major depression (Teasdale et al., 2000). A similar model has recently been suggested for reducing cognitive vulnerability to generalized anxiety disorder (Roemer & Orsillo, 2002).

The acceptance-based component of mindfulness approaches further offer an alternative strategy for dealing with aspects of unwanted private experience, and thus an opportunity to become less prone to being drawn into dysfunction patterns of behaviour that exacerbates or maintains psychopathology. As Hayes and his colleagues convincingly argue, most forms of psychopathology involves, in some way or another, the presence of intolerance with aspects of private experience and patterns of experiential avoidance as an attempt to escape private experience (see Hayes et al., 1996, for evidence supporting this view). They further cite substantial evidence that the most effective psychological treatments tend to undermine experiential avoidance in some way by exposing patients to aspects of feared or dreaded private experience, either behaviourally (e.g., desensitization for anxiety disorders) or by encouraging them to stay in touch with painful or frightening feelings and thoughts in psychotherapy.

Mindfulness approaches encourage patients to step out of the war with their thoughts and feelings and give up ineffective experiential avoidance strategies. The approach thus focuses on altering the *impact of*, and *response to*, thoughts, feelings and sensations. The general orientation of mindfulness approaches is on helping clients to stay in contact with private experiences so that they can behave more effectively. Mindfulness approaches may thus be particularly effective for clinical syndromes in which intolerance of negative affect and subsequent behavioural avoidance plays a central role, and there is some evidence to support this assertion. For example, MBSR has been shown to reduce the frequency of panic attacks and avoidance in panic disorder (Miller et al., 1995), binge-eating episodes associated with eating disorders (Kristheller & Hallett, 1999) and avoidance of activity in chronic pain thus reducing disability (Kabat-Zinn et al., 1985; 1987). Similarly, dialectical behaviour therapy, which incorporates mindfulness training, reduces self-mutilation and suicidal behaviour associated with

borderline personality disorder (Linehan et al., 1991), probably by helping patients to build affect tolerance.

Mindfulness can therefore be further conceptualized as a clinical approach to foster an alternative method for responding to one's stress and emotional distress. By becoming more aware of thoughts and feelings, relating to them in a wider, decentered field of awareness, and purposefully opening fully to one's experience, dysfunctional change agendas can be abandoned and more adaptive strategies adopted. As several recent investigators have recognized (e.g., Linehan, 1993; Teasdale et al., 1995; Marlat, 2002; Roemer & Orsillo, 2002), the concept of mindfulness can be theoretically integrated with current models of psychopathology and thus can lead to new innovations in treatment.

Implications for Measurement

One of our main objectives for establishing a consensus on mindfulness is to provide a theoretical and conceptual basis for instrument development. Our own approach has been to develop an instrument in which the response to items is in reference to an immediately preceding session involving the practice of a mindfulness technique. This approach is based on our conceptualization of mindfulness as a state-like phenomenon that is evoked and maintained by regulating attention. With this kind of instrument, we can therefore test the situational specificity of mindfulness. Additionally, by anchoring responses to a proximal mindfulness technique, we can minimize memory biases thus increasing reliability. We are relying on factor analytic procedures to establish factorial validity of the instrument (and construct), and convergent, discriminant and criterion-related validity is being established by examining the relation between our instrument and other measures as outlined in this paper.

If mindfulness is a learned skill, then an instrument must be able to demonstrate both incremental validity and sensitivity to change. Our approach has been to compare people who have been newly trained in mindfulness skills (8 weeks of mindfulness-based stress reduction) with participants who have extensive daily experience (2 years minimum) and no experience with mindfulness techniques. Incremental validity would be supported by demonstrating that experienced mindfulness practitioners score higher on the measure than less experienced practitioners, who in turn score higher than those with no experience. We are evaluating sensitivity to change by evaluating whether mindfulness scores increase in clients who are participating in mindfulness-based stress reduction, and in non-clinical samples of participants in intensive (10 day) mindfulness meditation training programs.

Identifying implicated psychological processes underlying attention regulation in mindfulness has allowed us to develop powerful tests for construct validity. We are currently examining whether, with training in mindfulness, an increase in mindfulness scores corresponds to improvements in performance on tasks that require skills in sustained attention, switching, inhibition of elaborative processing and adopting a wider perspective (using tasks described earlier in this paper). Thus we will be able to objectively verify self-reported improvements in attention regulation with mindfulness training. We are particularly excited about the potential utility of these tasks in addressing future questions concerning the mechanisms of action of mindfulness.

Conclusions

With a growing interest in the clinical applications of mindfulness and mindfulness-based approaches, a concomitant increase in attention directed toward rigorous research in this area is needed. Although we are encouraged by the recent appearance of randomized controlled trials in

the literature, and want to encourage similar future efforts, we also want to strongly impress the need for basic research investigating fundamental questions concerning this approach. At the most basic level, issues concerning the conceptual and operational aspects of mindfulness need to be addressed so that an instrument can be developed and questions concerning mediating role and mechanisms of action can be investigated. Our team is now developing such an instrument and exploring methodologies from cognitive psychology that can be used to investigate mechanisms of action.

References

- Astin, J. (1997). Stress reduction through mindfulness meditation: Effects on psychological symptomatology, sense of control, and spiritual experiences. *Psychotherapy and Psychosomatics, 66*: 97-106.
- Bagby, R. M., Taylor, G. J. & Parker, J. D. (1994). The twenty-item Toronto Alexithymia Scale: II: Convergent, discriminant, and concurrent validity. *Journal of Psychosomatic Research, 38(1)*, 33-40.
- Bishop, S. R. (2002). What do we really know about mindfulness-based stress reduction? *Psychosomatic Medicine, 64*, 71-84.
- Blumenthal, A. L. (1977). *The process of cognition*. New Jersey: Prentice Hall.
- Borkovec, T. D., Shadick, R. & Hopkins, M. (1991). The nature of normal and pathological worry. In R. Rapee & D. H. Barlow (Eds.), *Chronic anxiety: Generalized anxiety disorder and mixed anxiety-depression* (pp. 29-51). New York: Guilford.
- Breslin, C. F., Zack, M. & McMains, S. (2002). An information processing analysis of mindfulness: Implications for relapse prevention in the treatment of substance abuse. *Clinical Psychology: Science and Practice, 9*: 275-299.
- Bugenthal, J. F. T. (1987). *The art of the psychotherapist*. New York: W. W. Norton.
- Carlson, L.E., Ursuliak, Z., Goodey, E., Angen, M. & Speca, M. (2001). The Effects of a Mindfulness Meditation Based Stress Reduction Program on Mood and Symptoms of Stress in Cancer Outpatients: Six-month follow-up. *Supportive Care in Cancer, 9*, 112-123.
- Carver, C. S. & Scheier, M. F. (1981). *Attention and self-regulation*. New York: Springer.

- Carver, C. S. & Scheier, M. F. (1990). Principles of self-regulation: Action and emotion. In E. T. Higgins & R. M. Sorrentino (Eds.), *Handbook of motivation and cognition: Foundations of social behaviour* (Vol. 2, pp. 3-52). New York: Guildford.
- Csikszentmihalyi, M. (1997). *Finding flow: The psychology of engagement with everyday life*. New York: Basic Books.
- Conte, H. R. & Ratto, R. (1997). Self-report measures of psychological mindedness. In M. McCallum & W. E. Piper (Eds.), *Psychological mindedness: A contemporary understanding* (pp. 1-26). Mahwah, New Jersey: Lawrence Erlbaum Associates.
- Costa, P. T. & McCrae, R. R. (1987). Personality assessment in psychosomatic medicine: Value of a trait taxonomy. In G. A. Fava and T. N. Wise (Eds). *Advances in psychosomatic medicine: Research paradigms in psychosomatic medicine* (pp. 71-82). Basel, Switzerland: Karger.
- Deikman, A. (1982). *The observing self*. Boston,: Beacon Press.
- Flavell, J. H. (1979). Metacognition and metacognitive monitoring: A new area of cognitive-developmental inquiry. *American Psychologist*, 34, 906-911.
- Fingarette, H. (1963). *The self in transformation: Psychoanalysis, philosophy and the life of the spirit*. New York: Basic Books.
- Folkman, S. & Lazarus, R. S. (1988). *Manual for the Ways of Coping Questionnaire*. Palo Alto, CA: Consulting Psychological Press.
- Fonagy P. & Target, M. (1996). Playing with reality I: Theory of mind and the normal development of psychic reality. *International Journal of Psychoanalysis*, 77, 217-233.
- Fonagy P. & Target, M. (1997). Attachment and reflective function: Their role in self-organization. *Development and Psychopathology*, 9, 679-700.

- Hanh, T.N. (1976). *The miracle of mindfulness: A manual for meditation*. Boston: Beacon Press.
- Hayes, S. C., Strosahl, K. & Willson, K. G. (1999). *Acceptance and commitment therapy: An experiential approach to behavior change*. New York: Guilford Press.
- Hayes, S. C., Wilson, K. G., Gifford, E. V., Follette, V. M. & Strosahl, K. (1996). Experiential avoidance and behavioral disorders: A functional dimensional approach to diagnosis and treatment. *Journal of Consulting and Clinical Psychology*, 64(6), 1152-1168.
- Henderson, J. M., Weeks, P. A. & Hollingworth, A. (1999). The effects of semantic consistency on eye movements during complex scene viewing. *Journal of Experimental Psychology: Human Perception and Performance*, 25, 210-228.
- Horowitz, M. (2002). Self- and relational observation. *Journal of Psychotherapy Integration*, 12(2), 115-127.
- James, W. (1890). *The principles of psychology, volume 1*. New York: Dover.
- Jersild, A.T. (1927). Mental set and shift. *Archives of Psychology*, 14 (89), 81.
- Kabat-Zinn, J. (1982). An outpatient program in behavioral medicine for chronic pain patients based on the practice of mindfulness meditation: Theoretical considerations and preliminary results. *General Hospital Psychiatry*, 4, 33-47.
- Kabat-Zinn, J. (1998). Meditation. In J.C. Holland (Ed), *Psycho-oncology* (pp. 767 – 79). New York, NY: Oxford University Press.
- Kabat-Zinn, J. (1990). *Full Catastrophe Living: Using the Wisdom of your Mind to Face Stress, Pain and Illness*. New York: Dell Publishing.
- Kabat-Zinn, J., Lipworth, L. & Burney, R. (1985). The clinical use of mindfulness meditation for the self-regulation of chronic pain. *Journal of Behavioral Medicine*, 8, 163-190.

- Kabat-Zinn, J., Lipworth, L., Burney, R. & Sellers, W. (1987). Four-year follow-up of a meditation-based program for the self-regulation of chronic pain: Treatment outcome and compliance. *Clinical Journal of Pain*, 2, 159-173.
- Klee, S. H. & Garfinkel, B. D. (1983). The computerized continuous performance task: A new measure of inattention. *Journal of Abnormal Psychology*, 11, 487-495.
- Kristeller, J. L. & Hallett, C. B. (1999). An exploratory study of a meditation-based intervention for binge eating disorder. *Journal of Health Psychology*, 4, 357 - 63.
- Labouvie-Vief, G., Chiodo, L. M., Goguen, L. A., Diehl, M. & Orwoll, L. (1995). Representations of self across the life span. *Psychology and Aging*, 10, 404-415.
- Lane R. D., Quinlan, D. M., Swartz, G. E., Walker, P. A. & Zeitlin, S. B. (1987). The Levels of Emotional Awareness Scale: A cognitive-developmental measure of emotion. *Journal of Personality Assessment*, 55, 124-134..
- Linehan, M. M. (1993). *Cognitive-behavioral treatment of borderline personality disorder*. New York: Guilford Press.
- Linehan, M. M., Armstrong, H. E., Saurez, A., Allmon, D., & Heard, H. L. (1991). Cognitive behavioral treatment of chronically parasuicidal borderline patients. *Archives of General Psychiatry*, 48, 1060-1064.
- Marlat, G. A. (2002). Buddhist philosophy and the treatment of addictive behavior. *Cognitive and Behavioral Practice*, 9, 44-49.
- Martin, J. P. (1997). Mindfulness: A proposed common factor. *Journal of Psychotherapy Integration*, 7, 291-312.
- Martin, J. P. (2002). The common factor of mindfulness – An expanding discourse: Comment on Horowitz (2002). *Journal of Psychotherapy Integration*, 12(2) 139-142.

- Martin, L. L. & Tesser, A. (1989). Toward a motivational and structural model of ruminative thought. In J. S. Uleman & J. A. Bargh (Eds.), *Unintended thought: The limits of awareness, intention, and control* (pp. 306-326). New York: Guilford.
- McCallum, M. & Piper, W. E. (1987). *Integration of psychological mindedness and related constructs*. Mahwah, New Jersey: Lawrence Erlbaum Associates.
- Miller, G. A., Galanter, E. & Pribram, K. H. (1960). *Plans and the structure of behavior*. New York: Holt, Rinehart & Wilson.
- Miller, J. J., Fletcher, K. & Kabat-Zinn, J. (1995). Three-year follow-up and clinical implications of a mindfulness meditation-based stress reduction intervention in the treatment of anxiety disorders. *General Hospital Psychiatry*, 17, 192-200.
- Miller, S. M. (1980). When is a little information a dangerous thing? Coping with stressful life events with monitoring versus blunting. In S. Levin & H. Ursin (Eds.). *Coping and Health* (pp. 145-169). New York: Plenum.
- Miller, S. M. & Mangan, C. E. (1983). Interacting effects of information on coping style in adapting to gynecologic distress: Should the doctor tell all? *Journal of Personality and Social Psychology*, 45, 223-236.
- Moore, R. G., Hayhurst, H. & Teasdale, J. D. (1996). *Measure of awareness and coping in autobiographical memory: Instructions for administering and coding*. Unpublished manuscript, Department of Psychiatry, University of Cambridge.
- Muran, J. C. (2002). A relational approach to understanding change: Plurality and contextualism in a psychotherapy research program. *Psychotherapy Research*, 12 (2), 113-138.
- Naranjano, C. & Ornstein, R. E. (1971). *On the psychology of meditation*. New York: Viking Press.

- Nelson, T. O., Stuart, R. B., Howard, C. & Crowley, M. (1999). Metacognition and clinical psychology: A preliminary framework for research and practice. *Clinical Psychology and Psychotherapy*, 6, 73-70.
- Nolen-Hoeksema, S. (1991). Responses to depression and their effects on the duration of depressive episodes. *Journal of Abnormal Psychology*, 100, 569-583.
- Oxford English Dictionary*. J. A. Simpson and E. S. C. Weiner. (Ed.). 2nd edition (1989). Oxford: Clarendon Press.
- Parasuraman, R. (1998). *The Attentive Brain*. Cambridge, MA: MIT Press.
- Peterson, R. A. & Reiss, S. (1992/1993). *Anxiety Sensitivity Index Revised Test Manual*. Worthington: IDS Publishing.
- Posner, M. I. (1980). Orienting of attention. *Quarterly Journal of Experimental Psychology*, 32(1), 3-25.
- Posner, M. I. & Rothbart, M. K. (1992). Attentional mechanisms and conscious experience. In A. D. Milner & M. D. Rugg (Eds.), *The neuropsychology of consciousness* (pp. 91-111). Toronto: Academic Press.
- Powers, W. T. (1973). Feedback: Beyond behaviorism. *Science*, 179, 351-356.
- Pyszczynski, T. & Greenberg, J. (1987). Self-regulatory preservation and the depressive self-focusing style: A self-awareness theory of reactive depression. *Psychological Bulletin*, 102, 12-138.
- Reibel, D. K., Greeson, J. M., Brainard, G. C. & Rosenzweig, S. (2001). Mindfulness-based stress reduction and health-related quality of life in a heterogeneous patient population. *General Hospital Psychiatry*, 23(4), 183-192.

- Roemer, L. & Orsillo, S. M. (2002). Expanding our conceptualization of and treatment for generalized anxiety disorder: Integrating mindfulness/acceptance-based approaches with existing cognitive-behavioral models. *Clinical Psychology-Science & Practice*, 9, 54-68.
- Schneider, W. & Shiffrin, R. M. (1977). Controlled and automatic human information processing: I. Detection, search, and attention. *Psychological Review*, 84, 1-66.
- Schraw, G. & Moshman, D. (1995). Metacognitive theories. *Educational Psychology Review*, 7, 351-371.
- Segal, Z.V., Williams, J. M. G. & Teasdale, J. D. (2002). *Mindfulness-based cognitive therapy for depression: A new approach for preventing relapse*. New York: Guilford Press.
- Segal, Z. V., Williams, J. M. G., Teasdale, J. D. & Gemar, M. (1996). A cognitive science perspective on kindling and episode sensitization in recurrent affective disorder. *Psychological Medicine*, 26, 371-380.
- Shapiro, S.L., Schwartz, G.E. (1999). Intentional systemic mindfulness: An integrative model for self-regulation and health. *Advances in Mind-Body Medicine*, 15, 128-134.
- Shapiro, S.L., Schwartz, G.E. (2000). The role of intention in self-regulation: Toward intentional systemic mindfulness. In M. Boekaerts & P. Pintrich (Eds.), *Handbook of self-regulation* (pp. 253-273). San Diego, CA: Academic Press.
- Shapiro, S.L., Schwartz, G.E., & Bonner, G. (1998). Effects of mindfulness-based stress reduction on medical and premedical students. *Journal of Behavioral Medicine*, 21, 581-599.
- Silananda, U. (1990). *The Four Foundations of Mindfulness*. Boston, MA: Wisdom Publications.

- Speca, M., Carlson, L., Goodey, E. & Angen, M. (2000). A randomized wait-list controlled trial: The effects of a mindfulness meditation based stress reduction program on mood and symptoms of stress in cancer outpatients. *Psychosomatic Medicine*, 62, 613-622.
- Teasdale, J. D. (1999). Metacognition, mindfulness and the modification of mood disorders. *Clinical Psychology and Psychotherapy*, 6, 146-155.
- Teasdale, J. D. (1999). Emotional processing, three modes of mind and the prevention of relapse in depression. *Behaviour Research & Therapy*, 37(Suppl 1), S53-S77.
- Teasdale, J. D. & Bernard, P. J. (1993). *Affect, cognition and change: Re-modeling depressive thought*. New Jersey: Lawrence Earlbaum Associates.
- Teasdale, J.D., Moore, R.G., Hayhurst, H., Pope, M., Williams, S. & Segal, Z. V. (2002). Metacognitive awareness and prevention of relapse in depression: Empirical evidence. *Journal of Consulting and Clinical Psychology*, 70(2), 275-287.
- Teasdale, J. D., Segal, Z. V., Williams, J. M. G. & Mark, G. (1995). How does cognitive therapy prevent depressive relapse and why should attentional control (mindfulness) training help? *Behavior Research and Therapy*, 33, 25-39.
- Teasdale, J. D., Segal, Z. V., Williams, J. M. G., Ridgeway, V. A, Soulsby, J. M. & Lau, M. A. (2000). Prevention of relapse/recurrence in major depression by mindfulness-based cognitive therapy. *Journal of Consulting and Clinical Psychology*, 68, 615-623.
- Telegan, A. & Atkinson, G. (1974). Openness to absorption and self-altering experiences: A trait related to hypnotic susceptibility. *Journal of Abnormal Psychology*, 83, 268-277.
- Telch, C. F., Agras, W. S. & Linehan, M. M. (2001). Dialectical behavior therapy for binge eating disorder. *Journal of Consulting & Clinical Psychology*, 69(6), 1061-1065.

- Thera, N. (1962). *The Heart of Buddhist Meditation: A Handbook of Mental Training Based on the Buddha's Way of Mindfulness*. London: Rider and Company.
- Tolar, A. & Reznikoff, M. (1960). A new approach to insight: A preliminary report. *Journal of Nervous and Mental Disease*, 130, 286-296.
- Trapnell, P. D. & Campbell, J. D. (1999). Private Self-Consciousness and the Five-Factor Model of Personality: Distinguishing Rumination from Reflection. *Journal of Personality and Social Psychology*, 76, 284-304.
- Wells, A. (2002). GAD, metacognition, and mindfulness: An information processing analysis. *Clinical Psychology-Science & Practice*, 9(1), 95-100.
- Williams, K.A., Kolar, M. M., Reger, B. E. & Pearson, J. C. (2001). Evaluation of a wellness-based mindfulness stress reduction intervention: A controlled trial. *American Journal of Health Promotion*, 15(6), 422-432.
- Williams, J. M.G., Mathews, A. & MacLeod, C. (1996). The emotional Stroop task and psychopathology. *Psychological Bulletin*, 120(1), 3-24.
- Wolfsdorf, B. A. & Zlotnick, C. (2001). Affect management in group therapy for women with posttraumatic stress disorder and histories of childhood sexual abuse. *Journal of Clinical Psychology*, 57(2), 169-181.