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Re-Conceptualizing Mindfulness: The Psychological Principles of Attending in Mindfulness Practice and Their Role in Well-Being

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Carmody JF. (2015). Re-Conceptualizing Mindfulness: The Psychological Principles of Attending in Mindfulness Practice and Their Role in Well-Being. Preventive and Behavioral Medicine Publications. Retrieved from https://escholarship.umassmed.edu/prevbeh_pp/355

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CHAPTER 4

Reconceptualizing Mindfulness

The Psychological Principles of Attending in Mindfulness Practice and Their Role in Well-Being

James Carmody

Mindfulness training (MT) has long played a key role in a Buddhist system designed to reduce mental suffering. It has now become integrated into Western medicine and psychology, based on research demonstrating the efficacy of several MT programs to reduce stress and distress in healthy people, in a number of diagnosed patient groups and in clinicians (Chiesa & Serretti, 2009, 2010; Hofmann, Sawyer, Witt, & Oh, 2010; Irving, Dobkin, & Park, 2009). Yet there are problems inherent in applying a construct and training approach from a non-Western, fully formed religious system to serve secular Western scientific, psychoeducational, and clinical purposes. In particular, this meeting of cultures and traditions has resulted in seemingly intractable disagreements about the nature and definition of mindfulness, the best means by which to conduct MT, and the conceptual nature of the pathways through which MT has its effects.

In this chapter I attempt to address these issues, drawing on 45 years of practice in the three main Buddhist traditions, along with years of experience researching the clinical effects and mechanisms of MT, and finally teaching mindfulness practice to patients and clinicians. I first briefly describe the role that mindfulness and MT plays in the Buddhist religious and philosophical system, then comment on the disagreements and confusions that result from carrying over Buddhist conceptualizations of human suffering into Western science and clinical settings. I then describe the effect of this on both the development of MT research and the training of people in need. In an effort to offer solutions to these dilemmas, I address the basis of mental suffering using a Western scientific framework rather than a Buddhist one as a basis for explaining the value of mind training programs such as MT. I do this in two ways:

First, I attempt to circumvent disagreements about both the meaning of mindfulness and the role of MT within a larger system of training by presenting an operational and needs-based conceptualization, based on evolutionary psychology, and of how practices typically taught in MT can reduce distress and increase well-being, including the genetically driven imperatives that make MT challenging and the value of mindfulness practice in diminishing their role in ongoing distress.

Second, I discuss the commonalities that MT has (and does not have) with other evidence-based psychological and mind–body trainings. I argue for the clinical and scientific advantages of this approach, highlighting (1) the clinical utility of using concepts already familiar to many Western patients and clinicians; (2) the provision of a stronger empirical foundation for how mindfulness can best be explained and taught, instead of relying on traditional assumptions and/or presumed expert testimony; and (3) the contribution of this approach to the development of a unified theory of the mechanisms underlying psychological and mind–body programs designed to reduce distress and increase well-being. I close this chapter with a discussion of several challenges that this approach faces.

The Buddhist Roots of Mindfulness

The Buddhist narrative is rooted in the primarily introspective approaches to knowledge in India at the time of Gautama the Buddha approximately 2,500 years ago. It places the root of the problem of human suffering in ignorance of the moment-by-moment construction of a sense of ownership of experience in the mind, and the dissatisfaction (suffering) that arises from the resultant craving and aversion. The cultivation of *mindfulness*, a term derived in the late 19th century as the translation for the Pali language word *sati* (see Gethin, Chapter 2, this volume), is one of the elements of a systematic eightfold path claimed to have been put forward by the historical Buddha as a way out of this ignorance and suffering. Recognition of the common goal that Buddhism, medicine, and psychology each have in reducing suffering has helped to pave the way for the entry of mindfulness and Buddhist MT exercises into Western medicine and psychotherapeutic programs.

Mindfulness Makes the Leap from Religious System to Science and Clinical Practice

The introduction of mindfulness practice into the secular world has involved passage from a religious setting wherein it serves as a heuristic/phenomenological tool for insight into the workings of one's own mind, into the world of empirical research and clinical practice. In making this transition, mindfulness itself has, inevitably, become an object of investigation. And since measurement is fundamental to scientific enquiry, operational definitions have been developed to serve as foundations for reliable and valid measures, and to test that outcomes attributed to mindfulness and MT are verifiable and reproducible.

This definition and measurement endeavor has not been without controversy. It has exposed significant disagreements in approaches to the construct, and specifically where and how a “true” understanding of mindfulness is to be found (Brown, Ryan, Loverich, Biegel, & West, 2011; Grossman, 2008, 2011). Disagreement is to be expected for two reasons. First, the Pali language is no longer understood outside the Indian scholarship community, and the term mindfulness has other, non-Buddhist meanings in English. Second, drawing a term from a religious system inevitably results in arguments about its “true” nature, and about where investigators should turn to establish its criterion and discriminant validity. For some investigators and instructors, mindfulness and Buddhism are inextricably coupled ideas; they identify as dharma practitioners on a path of “transformation,” and members of a community of mindfulness practitioners. Others come to it principally through Western psychology and may have no more personal connection to Buddhism than as a helpful lens through which to understand the origins of mindfulness and MT. For the former, correct understanding of mindfulness can come only from extended and correctly guided practice of it, and “true” exemplars of the concept are principally to be found within Buddhist texts and traditions. It can also extend to the assumption that mindfulness is sufficiently subtle and unique that it cannot be conceptualized or measured outside of an understanding of its broader Buddhist system—that is, without compromising or diminishing its “true” experiential meaning (Grossman, 2008, 2011; Rappay & Bystrisky, 2009).

While such convictions are understandable from a religious standpoint, they do not form a fruitful basis for exploring mindfulness in the clinical and scientific arena. Progress in scientific enquiry entails some measure of skepticism; thus, research into mindfulness must allow that because mindfulness is part of an age-old system, or an unquestioned part of a lineage, does not necessarily mean it has been correctly understood or is immune to further investigation, understanding, or development. An overly reverential attitude toward mindfulness and mindfulness practice can result in seeing them as something unique and “other,” and lead to orthodoxy, as is alluded to in the well-known Zen story about focusing on the finger rather than the moon toward which the finger points. But, as in any debate that bears upon matters of meaning, there will be the orthodox, those who insist upon the wisdom of taking refuge in traditional forms, transmissions, and narratives to safeguard what is seen as the true understanding, and those more willing to innovate. Such is the history and progress of human understanding. But if an attitude of orthodoxy is carried into the scientific arena, it raises legitimate concerns as to whether the research conducted from such a narrative is being undertaken as a genuine and open enquiry, or as an exercise to provide scientific credence for a pursuit already assumed to be unique, complete, and beneficial to all. Yet in the midst of these debates, progress has been made in defining and operationalizing mindfulness (Baum et al., 2010; Brown, West, Loverich, & Biegel, 2011), and in supporting the clinical effects of training in it. For example, MT has predicted higher levels of self-reported mindfulness, which in turn has been related to minutes of formal mindfulness practice (Carmody & Baer, 2008) and reductions in stress and distress (Baer, Carmody, & Hunsinger, 2012; Kuyken et al., 2010). Furthermore, there is evidence that the increased mindfulness and associated reductions in

stress and distress are enduring (Pbert et al., 2012). Yet this endeavor has also resulted in challenges to prevailing orthodoxies about mindfulness and MT.

Specifically, a number of the assumptions derived from contemplative traditions about what is required to obtain meaningful benefits from MT are not supported in clinical studies; these findings include the comparatively minimal length of training programs and amount of practice required to demonstrate significant change (Carmody & Baer, 2009; Jain et al., 2007; Pbert et al., 2012); the evidence that mindfulness can be taught without personal instruction (Gluck & Maercker, 2011); and evidence that increases in mindfulness resulting from therapeutic modalities not explicitly mindfulness-based can occur (Shelov, Suchday, & Friedberg, 2009; Tanner et al., 2009). Additionally, patient distress reduction has been demonstrated with therapeutic systems incorporating mindfulness that vary in their understandings of the construct such as dialectical behavior therapy and acceptance and commitment therapy, and guided by therapists with what some would consider limited experience of formal mindfulness practice. These findings contribute to the dialogue about “true” mindfulness by indicating that it appears to be an evolving concept, and that MT can be creatively explored and adapted without losing its value to enhance well-being. They counsel us also to empirically test traditional assumptions required for teaching and learning mindfulness.

The language used in definitions of mindfulness has also presented a challenge for scientific research and clinical work, as they use both traditional and contemporary terms that reflect the authors’ theoretical orientation and experience with MT. These include a present-centered attention to and awareness of all accessible events and experiences (Brown & Ryan, 2004); paying attention in a particular way: on purpose, in the present moment, and nonjudgmentally (Kabat-Zinn, 1994); and a nonelaborative, nonjudgmental, present-centered awareness in which each thought, feeling, or sensation that arises in the attentional field is acknowledged and accepted as it is (Bishop et al., 2004). Such elusive language, as well as cryptic descriptive terms such as *beginner’s mind*, *being in the moment*, *embodiment*, *a being mode rather than a doing mode*, and so on, have made more difficult the job of introducing the construct and its possible benefits in a straightforward way to patients and clinicians, and present problems for the operational definitions required for research.

So it is useful to ask whether mindfulness can be placed in a frame that (1) honors its roots while describing it through more readily familiar principles; (2) provides a clear and parsimonious conceptualization of the construct that accommodates trainees’ reports of its practical use in their everyday lives; and (3) can serve as a foundation for empirical hypotheses about causal relationships in advancing the psychology and biology of well-being.

To begin addressing these challenges, it is useful to place them in a larger context by revisiting the more fundamental question of why we should need something like mindfulness in the first place. For while it may be apparent that we have craving and aversion, and that they keep us ill-at-ease, as the Buddhist narrative describes, this does not explain the origins of the ignorance at the root of this suffering. Why is this ignorance present in a healthy human? Why is some level of dis-ease so prevalent, even among people with material needs well met? Why are we not naturally at ease?

Why Is Ease Not a Default Condition of the Mind?

The Role of Mindfulness in This Predicament

Attention plays a central role in interacting with the environment in ways that lead to the satisfaction of needs and their resultant desires, and attention training is the initial and central cognitive exercise in the cultivation of well-being through MT. This central role of attention was recognized by William James (1890) and confirmed by later experimental studies demonstrating the key role that effortful focusing of attention plays in well-being-supportive emotion regulation and self-regulated behavior (Baumeister & Heatherton, 1996; Kirschenbaum, 1987; Thayer, Friedman, & Borkovec, 1996). Given its importance, it is curious that we treat the regulation of attention as a naturally formed capacity; an assumption evident in the exhortations to our children to “just pay attention” when learning material in school. But patients report having difficulty in keeping attention focused during MT exercises (Segal, Williams, & Teasdale, 2002), and it is useful to ask why this should be a challenge. Why should attention require any training at all in the cultivation of day-to-day well-being?

The Buddhist explanation for suffering often evokes concepts of craving, aversion, and attachment, and is the lens sometimes used by MT instructors and clinicians. But an explanation using evolutionary principles may provide a culturally more familiar explanation for why attention should keep highlighting what we crave and seek to avoid, even to the detriment of well-being. From a standpoint of evolutionary adaptation, a key role of attention is to highlight in awareness features of the internal and external environment related to physical and reproductive survival needs. As such, it serves to highlight real and imagined opportunities for, and threats to the fulfillment of those needs. In the evolutionary past in which our central nervous system developed, physical danger was ever-present in the external environment, and the capacity of attention to highlight threats and opportunities would have had obvious survival value. And in the service of swift responding, evolutionary pressures appear to have resulted in automatic neural processes to direct attention—that is, in ways not requiring comparatively slow conscious, deliberate decisions. Such default, automatic movements of attention would have clear safety and survival value, and since most threats were likely to be physical in nature, attention was probably predominantly oriented to sensory processes that monitor the physical environment.

As threats to physical safety have been minimized in many modern societies, attention appears now to default to highlighting both real and imagined threats and opportunities for the satisfaction of higher order needs, such as those for relationship, status, and power. And while the satisfaction of these needs requires some level of sensory monitoring, it also requires a great deal of cognitive planning and reflection (Andrews-Hanna, 2012). This is evident from even limited observation of the way attention keeps leaving the sensory realm to favor cognitions that take the form of the ongoing commentary experienced as an internal narrative about oneself, others, and the larger world. This movement of attention in response to the planning and vigilance required to meet social demands in modern societies may well be continuing to evolve through epigenetic (Keverne & Curley, 2008) and cultural processes.

Based in memory and imagination, the internal narrative insistently plans, compares, judges, and regrets. Its role in the meeting of relationship, status, power, and other needs is experienced as the everyday concerns, worries, joys, and other emotionally tinged thoughts and images about such matters as the welfare of family and friends, work, money, and one's own social standing, well-being, and health. Attention preoccupied with this cognitive monitoring is experienced as rumination. As I describe in the following section, when these thoughts and images in attention are threat-based, their associated sensations will be constriction- or tension-related and the associated feeling tone will be an unpleasant one. The degree of constriction and unpleasantness will depend on the level of perceived threat and the perceived capacity to meet it. The ironic result of attention placed in the service of meeting needs by repeatedly dwelling on threat-based cognitive themes is the less-than-pleasant felt sense characterizing so much of life, and at times the real mental suffering that can result from this tendency.

In contrast to the sense of personal separation that characterizes cognitively oriented attention, the perceptible sensory world is held in common with others and is predominant in the pleasantness of delight. MT exercises recognize this principle in cultivating the capacity to make attention available to the senses and the perceptible world, and supporting this orientation in everyday life. For when attention is focused on current activities, experience once again becomes predominantly sense-based, with cognition secondary and immediate task-related (also called *concrete processing*; see Watkins, Chapter 6, this volume). At these times, the internal narrative recedes and the felt sense is less affected by its threat- and opportunity-oriented memories and imaginings. This is nicely demonstrated in an ambulatory study by Killingsworth and Gilbert (2010), who found that people reported being more happy when their attention was focused on what they were currently doing than when their minds were "wandering." Contrast this orientation with the preoccupation that results from attention being focused on the idiosyncratic memories and imaginings of the internal narrative. At those times, awareness of the sensory world is minimized, a situation that results in not only unpleasant everyday experience but also reduced opportunities for joy and connection with others.

With this evolution-based account of attention as background, I suggest three psychological principles that describe how MT and similar programs encourage trainees to attend to sense-based experience, whether bodily sensations or sensory experiences of the perceptible world, and I show how this orientation, together with the recognition of mental processes that accompany it, can reliably lead to the enhancement of well-being.

Using Psychological Principles to Describe MT and Its Benefits

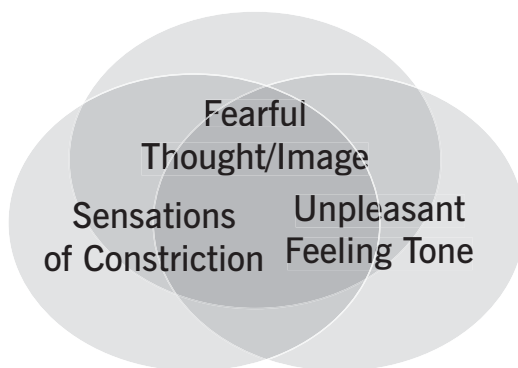
My experience researching, practicing, and teaching mindfulness leads me to suggest that there are just a few psychological principles underpinning the benefits that accrue from MT, and that these can be explained thorough fairly simple and perhaps familiar terms, some of which are also embedded in other therapeutic modalities.

First Principle: Recognition of the Components of Experience

The construction of the experience of ourselves and the world begins in childhood in the realm of sensation and affect, while development of the cognitive component is gradual, implicit, and incremental (Blair, 2002). As development proceeds, these components become so fully integrated that the distinction between them is not apparent to our usual awareness (Pessoa, 2008). This blindness to the components, and the conditioned cycles of association they form, represents one face of the ignorance at the root of suffering referred to in the Buddhist narrative. This is not willful neglect but lack of recognition of how our experience is being created from moment to moment through the conditioned patterns we have acquired and the behaviors we are acting out—a condition that can result in feelings of helplessness in the face of ongoing mental distress.

It can metaphorically be compared to the kind of ignorance fish have about water. If it were possible to ask a talking fish about the water in which it lives, it would very likely respond, “What’s water?” The fish can see objects in the water, but the water itself is less visible because the fish has never known any other perceptual medium. In relation to the apparently seamless components comprising experience, and their background of awareness, we are in a position similar to that of the fish. For while the effects of one or another overt behavior or cognition on our life may be more or less apparent, the more subtle conditioned associations forming the core of everyday experience that began before we had the capacity to reflect often remain unperceived. This undifferentiated experience that can lead to distress is illustrated in Figure 4.1. It is often the place at which people come to MT, or into psychotherapy—recognizing that life is not working in a way they find satisfactory, but not fully aware of the role their mental processes are playing in creating or maintaining the situation.

The challenge in the psychoeducational and therapeutic encounter then becomes: How does a person learn about the mental environment in which he or she lives? One way draws upon classical Greek philosophy, a method of investigation that was



Patient reports:
“I feel tense/anxious/stressed/uptight all the time . . .”

FIGURE 4.1. When the components of experience are undifferentiated, it appears seamless and the cycle of distress is maintained.

developing around the same time that mindfulness-based inquiry was developing in another part of the world. The classical Greek approach is concerned with the use of reason to investigate underlying principles in observed phenomena. In the present context, it is the dynamics of the person's cognitions and beliefs, and whether they are moving the person toward a satisfying life. Therapy may involve helping to uncover and recognize the implicit narrative that the cognitions form, and working to resolve conflicts embedded in the narrative, as in Freudian and other psychodynamic psychotherapies; or it may concern itself with the identification of dysfunctional elements, such as self-defeating or irrational thoughts and behaviors, and the replacement of them with more functional ones. This approach is well developed in cognitive-behavioral therapy (CBT).

In contrast, MT is less concerned with the content of dysfunctional cognitions than with the experiential recognition of how all felt experience is constructed through the normally perceptually undifferentiated components (thoughts, sensations, and pleasant/unpleasant/neutral feeling tone), and the mental dynamics by which those components coalesce from moment to moment to create both functional and dysfunctional responses. This recognition results first from curiosity about these processes and then practice of the mindfulness exercises that bring close attention to, and discriminate between, the components of experience.

Support for the experiential recognition of these processes can be seen in what is usually the initial MT exercise taught in mindfulness-based stress reduction (MBSR; Kabat-Zinn, 1990), known as the *body scan*. In this exercise, the trainee is asked to direct attention systematically to each part of the body and to notice any sensations that may be present there, including the more subtle and neglected sensations escaping awareness in everyday life, while refraining from the attempt to change them in any way. This bare noticing represents an implicit acceptance of the experience. The instructions also ask the trainee to notice the difference between the sensations, and any thoughts and pleasant or unpleasant feeling tone associated with them. In endeavoring to keep attention on the bodily sensations, the trainee typically notices that it does not stay there, and through an awareness of which components attention goes to, such as thoughts about the sensation or its feeling tone, the trainee learns to distinguish between the three major components of experience, and their conditioned cycles of associations become apparent. This is illustrated in Figure 4.2. This

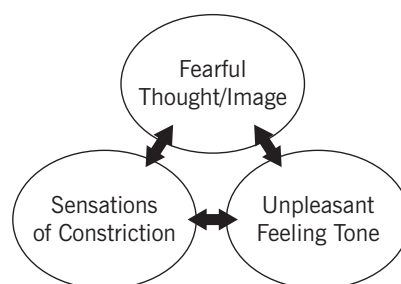


FIGURE 4.2. Components of experience recognized as differentiated and connected. Opportunity arises for self-regulation.

recognition is sometimes supported by encouraging a basic naming of the component in focal attention as a thought, sensation, or feeling.

Second Principle: Emotional Arousal Can Be Self-Regulated through Attention Regulation

Arousal tends to follow the valence of the object of attention—whether the object has positive, negative, or neutral emotional associations. This, too, becomes experientially apparent through the body scan exercise, when the first area of sensations to which the instructions direct attention are those associated with breathing—sensations that, for the most part, are an arousal-neutral object of attention and so associated with a benign affective state. This facility, often referred to as “awareness of the breath,” is established at the outset because it provides readily available access to a more calming experience to which one can return in moments of stress.

As practice proceeds, the trainee becomes more aware of those experiential objects to which attention is characteristically drawn, and also becomes aware that attention itself can be better regulated through training. By learning to notice which component(s) of experience attention is focused on at any given moment, the trainee can choose to keep it there or to redirect it to a more arousal-neutral perceptual object. Now, instead of passively allowing the usually automatic cycle of associations maintaining distress to occupy attention, the trainee has the option of interrupting cycles when they are not productive, by deliberately redirecting attention to an arousal-neutral object, such as the sensations of breathing, thereby creating greater calm. Self-reports of a large majority of MBSR trainees indicate that they attach high importance to this simple attention redirection skill in moments of stress/distress (Kabat-Zinn, 1987). Figure 4.3 illustrates how the regulation of attention creates an opportunity for some internal control in the face of stress and distress. This redirection of attention can be distinguished from experiential avoidance, which involves a compulsive mental (or physical) turning away from difficult experiences (Hayes, Wilson, Gifford, Follette, & Strosahl, 1996).

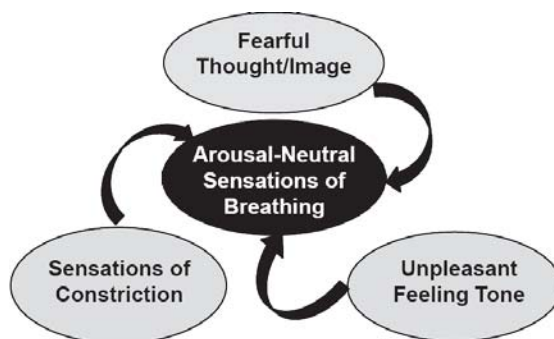


FIGURE 4.3. Cycle maintaining distress is interrupted by self-regulation of attention from differentiated components to arousal-neutral sensations of breathing.

Third Principle: The Development of a Decentered Perspective

The recognition that the thought/image, sensation, and feeling components of experience are simply events occurring in awareness is also implicitly developed through this process. It has been referred to as *decentering* (Segal et al., 2002) and *metacognition* (Bishop et al., 2004), and suggests the development of an “observing self” (Deikman, 1982) that notices experiential processes occurring but is apparently separable from them. This principle is illustrated in Figure 4.4, using as an example a thought commonly reported during panic attacks.

These three principles all center on the process of attending to experience, and their role in MT is supported by three lines of evidence. Consistent with the first principle, while MT participants initially report finding mindfulness exercises challenging (Segal et al., 2002), studies of MT effects on attention processes show an increase in volitional orienting of attention (Chan & Woollacott, 2007; Jha, Krompinger, & Baime, 2007) and improved performance on sustained attention tasks (Lutz et al., 2009); performance on such tasks has also been related to length of mindfulness practice experience (Valentine & Sweet, 1999). Brain imaging studies also show that the default processes of attending are amenable to change with MT (Brewer et al., 2011; Chiesa & Serretti, 2010; Hölzel et al., 2010). Consistent with the second principle, MT has been shown to reduce self-reported rumination (e.g., Campbell, Labelle, Bacon, Faris, & Carlson, 2012), an indicator of attention uncomfortably wandering from immediate tasks to become captivated by the internal narrative. MT program graduates also show less activation of brain regions involved in narrative processing of self-relevant stimuli and greater activation of regions implicated in “experiential” processing, relative to novices (Farb et al., 2007). Finally, and consistent with the third principle, decentering appears to increase with participation in MT programs (Carmody Baer, Lykins, & Olendzki, 2009; Feldman, Greeson, & Senville, 2010; Teasdale et al., 2002), although such change has not yet been shown to predict stress and distress-related outcomes.

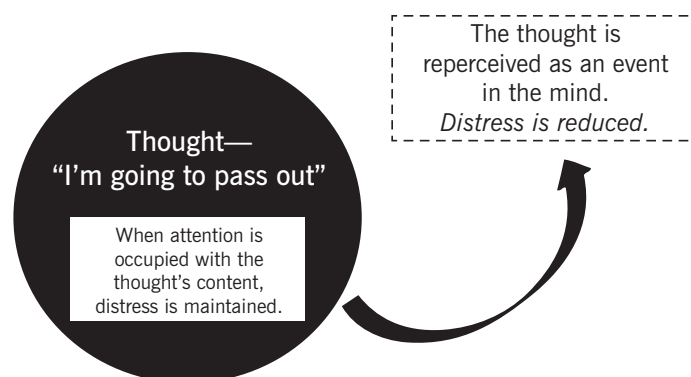


FIGURE 4.4. Re-perceiving reduces distress through a perceptual/attentional shift from what the thought is about—“I’m going to pass out”—to “This is a thought.” The thought is recognized as an event in the mind/awareness.

While these conceptually straightforward principles of attending can form a useful foundation for a clinical explanation of MT and its benefits to well-being, simply describing them does not appear sufficient to evoke changes in habits of attending; the biological and learning-based imperatives driving attention are of such strength as to require experiential practice to derive benefits (Carmody & Baer, 2008). How much MT and mindfulness practice is required for significant benefit remains an open question. The typical 30- to 45-minute daily practice periods in MBSR and related programs have been assumed to be the necessary amount, but studies (e.g., Tang et al., 2007, 2009; see also Tang & Posner, Chapter 5, this volume) indicate that much shorter instruction and practice time is enough to produce positive neurobiological changes and subjectively perceived benefits, at least over the very short-term periods in which outcomes have been measured.

Commonality and Uniqueness of Mindfulness with Other Clinical Trainings

Identifying the psychological principles of attending embedded in MT reveals those features that are unique to mindfulness, and also the degree to which the principles and practices are shared with other therapeutic programs. The first principle, in which MT allows participants to recognize and discriminate between the components that aggregate to form mental constructions and their conditioned associations, is not unique to MT. CBT, for example, focuses on the recognition of self-defeating thoughts/beliefs and their downstream effects in the patient's life, and progressive muscle relaxation is largely an exercise in noticing sensations, similar to the body scan exercise. Mindfulness training is unique, however, in the completeness of the deconstruction of the components, its focus on rediscovering the broader realm of sensation rather than just those associated with the musculature, and in the acceptance of experience that is implicit in refraining from the attempt to change the thoughts, sensations, and feelings that are noticed in the training exercises.

The second principle, in which patients recognize that arousal levels follow the valence of the object of attention, together with the possibility of redirecting attention to more arousal-neutral objects, is common to a number of other therapeutic and mind-body systems. So while attention to the sensations of breathing, or the broader sensory realm serves this function in MT, other therapeutic programs and religious practices promote the use of other arousal-neutral (or affectively positive) attentional objects, such as mantras, prayers, affirmations, visualizations, statements of self-compassion, and so forth. Deliberately bringing attention to one of these affect-neutral/positive mental objects achieves a similar purpose to that of MT by interrupting the internal monologue and the cycle of conditioned components maintaining distress, with purportedly positive effects on felt experience. The third principle, the development of decentering, is implicit also in CBT but the generalizable attention training exercises of MT facilitate decentering in a way that CBT's focus on dysfunctional cognitive content likely truncates.

Probably the most unique contributions that MT has introduced to clinical and community-based programs are in the training exercises themselves. For despite the

centrality of attention regulation to well-being (Posner & Rothbart, 2007), Western therapeutic systems have not developed intensive attention training exercises. MT has most fruitfully filled this gap through the support that the exercises provide in actualizing important qualities of attending, with the consequent positive psychological changes that support mental health in everyday life.

Clinical and Scientific Advantages in Reconceptualizing Mindfulness and MT

Conceptualizing mindfulness and its training in the way I have presented here has a number of scientific and clinical advantages. First, basing it on the phenomenology of the activities involved in typical MT exercises honors the roots of mindfulness and its training without being caught in deliberations on what is “true” mindfulness or arguments about the wisdom embedded in orthodoxy. Second, placing the habits of attention in an evolutionary frame and employing familiar psychological principles and constructs about attention training takes advantage of Western scientific advances, and embeds the problem of suffering within the ecology of a mind that has developed over millenia to serve ancestral human needs. As such, it can provide a modern frame for people in both therapeutic and psychoeducational settings to better understand the everyday working of the mind and its propensity toward suffering, why changing its functioning is such a challenge, and how MT may help in meeting this challenge. Understanding that these mental tendencies are working for the person’s benefit means they can be regarded as processes to be reguied rather than an enemy to be grappled with, and so can foster patience in working with them when they are encountered in MT.

A third advantage of portraying MT as an integrated collection of attending-related trainings is that the problem of psychological suffering and healing is approached through the more general question: What qualities of attending to experience are associated with well-being and the reduction of distress? Focusing on common therapeutic processes in this way rather than the uniqueness of MT improves our understanding of the more general psychological processes by which distress is created and maintained. As such, it encourages development of a unified theory of the mechanisms by which mind–body and other therapeutic programs have their beneficial effects that, in turn, provides a conceptual foundation for informed innovation and adaptation of treatments for specific conditions. Also important is framing MT and other attending-based trainings in simple, familiar, and empirically supported terms that provide a basis for a coherent explanation of the training to patients that can be adapted to their individual circumstances, temperament, and education level.

Challenges to Reconceptualizing Mindfulness and MT

A number of pressures work against a Western psychological science-based conceptualization such as this. When mindfulness fulfills a quasi-religious function, there is the understandable impulse to emphasize and demonstrate the uniqueness of the

phenomenon and the training exercises. In this respect, the term *mindfulness* may have become problematic to the degree that it is seen as a way of being that requires a singular training that is fundamentally different from other therapeutic constructs and modalities. Furthermore, competition for research funding dollars, and the maintenance of enterprises and organizations in the self-help and therapeutic marketplace, may depend on their offerings being seen as unique. These pressures can lead to conceptual silos, and the parallels and overlap that MT, the relaxation response, transcendental meditation, tai chi, yoga, CBT, and other interventions have with one another tend not to be made apparent. The effect on research of this pressure to highlight the uniqueness of each modality is evident in the small number of trials that directly compare these therapeutic programs and their mechanisms. Approaching intervention research in this way impedes progress in understanding and does a disservice to prospective participants and therapists by presenting them with a potentially confusing array of treatment options and no clear conceptual basis to choose among them.

A focus on psychological processes also faces pressure from the contention that its dependence on evidence from self-report instruments makes it scientifically “soft” compared to the deceptively “hard” science of biochemical (e.g., Daubenmier et al., 2012) and neural (e.g., Hölzel et al., 2011) approaches to understanding the effects of this or that program. While neurobiological studies are a rich source of knowledge about the biological correlates of MT, and provide value in addressing questions about therapeutic mechanisms, the view that they are fundamentally more objective—and by implication more scientifically and clinically useful—than psychological studies is not necessarily accurate. For even the most sophisticated brain imaging studies of mindfulness-related trainings rely ultimately upon subjects’ self-reports of their adherence and fidelity to the training, or that they are generating a particular mental state while in the scanner. Subjects’ understanding of their training will also be idiosyncratic, and training modalities will have unique neurobiological effects associated with their regimens not necessarily related to cognitive and emotional benefits.

Identifying neurobiological treatment mechanisms is likely to be a long and challenging endeavor, and giving such outcomes primacy may result in a view that biological explanations are the only empirically useful ones. But it is the intimacy of the psychological that brings people to enroll in psychoeducational and therapeutic programs, not their complaints about, for example, a poverty of amygdala–prefrontal cortical connections. A focus on psychological mechanisms that address phenomenological processes using constructs familiar in everyday experience can provide a more meaningful and accessible explanation about how MT and other interventions work to reduce distress than does a biological or neural narrative. As such, the psychological approach is more likely to be immediately profitable in harnessing participants’ motivation to change and their understanding about how it can be done.

Conclusions

Conceptualizing mindfulness, and training in it, through the lens of evolutionary theory, the processes of attending, and familiar psychological principles can illustrate

how the lack of ease in everyday life results from a biological imperative, separable from patients' particular personal circumstances. An evolutionary approach recognizes human attentional tendencies as part of a mental ecology that steadfastly, if sometimes unhelpfully, works to meet our needs. This understanding may foster patience in working with these tendencies by regarding them as processes to be reguider rather than an enemy with which to grapple. Though attention regulation is central to well-being and other valued outcomes (Posner & Rothbart, 2007), mainstream Western therapeutic modalities rarely used exercises to cultivate attention skills—a gap that MT can fill to great effect in supporting adaptive functioning (see Parts IV and V of this volume). Focusing on the underlying principles of MT that are associated with well-being provides both an opportunity to simplify treatment descriptions and explanations, and common ground for better understanding the conceptual overlaps relative to the role of attending, for example, that may exist across a variety of therapeutic approaches. In the end, this can only benefit those in need.

REFERENCES

- Andrews-Hanna, J. R. (2012). The brain's default network and its adaptive role in internal mentation. *Neuroscientist*, *18*(3), 251–270.
- Baer, R., Carmody, J., & Hunsinger, M. (2012). Weekly change in mindfulness and perceived stress in a mindfulness-based stress reduction program. *Journal of Clinical Psychology*, *68*(7), 755–765.
- Baum, C., Kuyken, W., Bohus, M., Heidenreich, T., Michalak, J., & Steil, R. (2010). The psychometric properties of the Kentucky Inventory of Mindfulness Skills in clinical populations. *Assessment*, *17*(2), 220–229.
- Baumeister, R. F., & Heatherton, T. F. (1996). Self-regulation failure: An overview. *Psychological Inquiry*, *7*(1), 1–15.
- Bishop, S., Lau, M., Shapiro, S., Carlson, L., Anderson, N. D., Carmody, J., et al. (2004). Mindfulness: A proposed operational definition. *Clinical Psychology: Science and Practice*, *11*(3), 230–241.
- Blair, C. (2002). School readiness: Integrating cognition and emotion in a neurobiological conceptualization of children's functioning at school entry. *American Psychologist*, *57*(2), 111–127.
- Brewer, J. A., Worhunsky, P. D., Gray, J. R., Tang, Y. Y., Weber, J., & Kober, H. (2011). Meditation experience is associated with differences in default mode network activity and connectivity. *Proceedings of the National Academy of Sciences*, *108*(50), 20254–20259.
- Brown, K. W., & Ryan, R. M. (2004). Perils and promise in defining and measuring mindfulness: Observations from experience. *Clinical Psychology: Science and Practice*, *11*(3), 242–248.
- Brown, K. W., Ryan, R. M., Loverich, T. M., Biegel, G. M., & West, A. M. (2011). Out of the armchair and into the streets: Measuring mindfulness advances knowledge and improves interventions: Reply to Grossman (2011). *Psychological Assessment*, *23*(4), 1041–1046.
- Brown, K. W., West, A. M., Loverich, T. M., & Biegel, G. M. (2011). Assessing adolescent mindfulness: Validation of an adapted Mindful Attention Awareness Scale in adolescent normative and psychiatric populations. *Psychological Assessment*, *23*(4), 1023–1033.

- Campbell, T. S., Labelle, L. E., Bacon, S. L., Faris, P., & Carlson, L. E. (2012). Impact of mindfulness-based stress reduction (MBSR) on attention, rumination and resting blood pressure in women with cancer: A waitlist-controlled study. *Journal of Behavioral Medicine, 35*(3), 262–271.
- Carmody, J., & Baer, R. A. (2008). Relationships between mindfulness practice and levels of mindfulness, medical and psychological symptoms and well-being in a mindfulness-based stress reduction program. *Journal of Behavioral Medicine, 31*(1), 23–33.
- Carmody, J., & Baer, R. A. (2009). How long does a mindfulness-based stress reduction program need to be?: A review of class contact hours and effect sizes for psychological distress. *Journal of Clinical Psychology, 65*(6), 627–638.
- Carmody, J., Baer, R. A., Lykins, E. L. B., & Olendzki, N. (2009). An empirical study of the mechanisms of mindfulness in a mindfulness-based stress reduction program. *Journal of Clinical Psychology, 65*(6), 613–626.
- Chan, D., & Woollacott, M. (2007). Effects of level of meditation experience on attentional focus: Is the efficiency of executive or orientation networks improved? *Journal of Alternative and Complementary Medicine, 13*(6), 651–658.
- Chiesa, A., & Serretti, A. (2009). Mindfulness-based stress reduction for stress management in healthy people: A review and meta-analysis. *Journal of Alternative and Complementary Medicine, 15*, 593–600.
- Chiesa, A., & Serretti, A. (2010). A systematic review of neurobiological and clinical features of mindfulness meditations. *Psychological Medicine, 40*(8), 1239–1252.
- Daubenmier, J., Lin, J., Blackburn, E., Hecht, F. M., Kristeller, J., Maninger, N., et al. (2012). Changes in stress, eating, and metabolic factors are related to changes in telomerase activity in a randomized mindfulness intervention pilot study. *Psychoneuroendocrinology, 37*(7), 917–928.
- Deikman, A. J. (1982). *The observing self*. Boston: Beacon Press.
- Farb, N. A. S., Segal, Z. V., Mayberg, H., Bean, J., McKeon, D., Fatima, Z., et al. (2007). Attending to the present: Mindfulness meditation reveals distinct neural modes of self-reference. *Social Cognitive and Affective Neuroscience, 2*(4), 313–322.
- Feldman, G., Greeson, J., & Senville, J. (2010). Differential effects of mindful breathing, progressive muscle relaxation, and loving-kindness meditation on decentering and negative reactions to repetitive thoughts. *Behaviour Research and Therapy, 48*(10), 1002–1011.
- Gluck, T. M., & Maercker, A. (2011). A randomized controlled pilot study of a brief web-based mindfulness training. *BMC Psychiatry, 11*(1), 175.
- Grossman, P. (2008). On measuring mindfulness in psychosomatic and psychological research. *Journal of Psychosomatic Research, 64*(4), 405–408.
- Grossman, P. (2011). Defining mindfulness by how poorly I think I pay attention during everyday awareness and other intractable problems for psychology's (re)invention of mindfulness: Comment on Brown et al. (2011). *Psychological Assessment, 23*(4), 1034–1040.
- 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.
- Hofmann, S. G., Sawyer, A. T., Witt, A. A., & Oh, D. (2010). The effect of mindfulness-based therapy on anxiety and depression: A meta-analytic review. *Journal of Consulting and Clinical Psychology, 78*(2), 169–183.
- Hölzel, B. K., Carmody, J., Evans, K. C., Hoge, E. A., Dusek, J. A., Morgan, L., et al. (2010). Stress reduction correlates with structural changes in the amygdala. *Social Cognitive and Affective Neuroscience, 5*(1), 11–17.

- Hölzel, B. K., Lazar, S. W., Gard, T., Schuman-Olivier, Z., Vago, D. R., & Ott, U. (2011). How does mindfulness meditation work?: Proposing mechanisms of action from a conceptual and neural perspective. *Perspectives on Psychological Science*, 6(6), 537–559.
- Irving, J. A., Dobkin, P. L., & Park, J. (2009). Cultivating mindfulness in health care professionals: A review of empirical studies of mindfulness-based stress reduction (MBSR). *Complementary Therapies in Clinical Practice*, 15(2), 61–66.
- Jain, S., Shapiro, S. L., Swanick, S., Roesch, S. C., Mills, P. J., Bell, I., et al. (2007). A randomized controlled trial of mindfulness meditation versus relaxation training: Effects on distress, positive states of mind, rumination, and distraction. *Annals of Behavioral Medicine*, 33(1), 11–21.
- James, W. (1890). *The principles of psychology*. New York: Holt.
- Jha, A., Krompinger, J., & Baime, M. J. (2007). Mindfulness training modifies subsystems of attention. *Cognitive Affective and Behavioral Neuroscience*, 7(2), 109–119.
- Kabat-Zinn, J. (1990). *Full catastrophe living*. New York: Bantam Doubleday Dell.
- Kabat-Zinn, J. (1994). *Wherever you go, there you are*. New York: Hyperion.
- Keverne, E. B., & Curley, J. P. (2008). Epigenetics, brain evolution and behaviour. *Frontiers in Neuroendocrinology*, 29(3), 398–412.
- Killingsworth, M. A., & Gilbert, D. T. (2010). A wandering mind is an unhappy mind. *Science*, 330, 932.
- Kirschenbaum, D. S. (1987). Self-regulatory failure: A review with clinical implications. *Clinical Psychology Review*, 7(1), 77–104.
- Kuyken, W., Watkins, E., Holden, E., White, K., Taylor, R. S., Evans, A., et al. (2010). How does mindfulness-based cognitive therapy work? *Behaviour Research and Therapy*, 48(11), 1105–1112.
- Lutz, A., Slagter, H. A., Rawlings, N. B., Francis, A. D., Greischar, L. L., & Davidson, R. J. (2009). Mental training enhances attentional stability: Neural and behavioral evidence. *Journal of Neuroscience*, 29, 13418–13427.
- Pbert, L., Madison, J. M., Druker, S., Olendzki, N., Magner, R., Reed, G., et al. (2012). Effect of mindfulness training on asthma quality of life and lung function: A randomised controlled trial. *Thorax*, 67(9), 769–776.
- Pessoa, L. (2008). On the relationship between emotion and cognition. *Nature Reviews Neuroscience*, 9(2), 148–158.
- Posner, M. I., & Rothbart, M. K. (2007). Research on attention networks as a model for the integration of psychological science. *Annual Review of Psychology*, 58, 1–23.
- Rapgay, L., & Bystrisky, A. (2009). Classical mindfulness. *Annals of the New York Academy of Sciences*, 1172(1), 148–162.
- Segal, Z. V., Williams, J. M. G., & Teasdale, J. D. (2002). *Mindfulness-based cognitive therapy for depression: A new approach to preventing relapse*. New York: Guilford Press.
- Shelov, D. V., Suchday, S., & Friedberg, J. P. (2009). A pilot study measuring the impact of yoga on the trait of mindfulness. *Behavioural and Cognitive Psychotherapy*, 37(5), 595–598.
- Tang, Y., Ma, Y., Fan, Y., Feng, H., Wang, J., Feng, S., et al. (2009). Central and autonomic nervous system interaction is altered by short-term meditation. *Proceedings of the National Academy of Sciences USA*, 106, 8865–8870.
- Tang, Y., Ma, Y., Wang, J., Fan, Y., Feng, S., Lu, Q., et al. (2007). Short-term meditation training improves attention and self-regulation. *Proceedings of the National Academy of Sciences USA*, 104, 17152–17156.
- Tanner, M. A., Travis, F., Gaylord-King, C., Haaga, D. A. F., Grosswald, S., & Schneider, R. H. (2009). The effects of the transcendental meditation program on mindfulness. *Journal of Clinical Psychology*, 65(6), 574–589.

- 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.
- Thayer, J. A., Friedman, B. H., & Borkovec, T. D. (1996). Autonomic characteristics of generalized anxiety disorder and worry. *Society of Behavioral Psychiatry, 39*, 255–266.
- Valentine, E. R., & Sweet, P. L. G. (1999). Meditation and attention: A comparison of the effects of concentrative and mindfulness meditation on sustained attention. *Mental Health, Religion and Culture, 2*(1), 59–70.