

# Mindfulness and Anxiety Disorders: Developing a Wise Relationship with the Inner Experience of Fear

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*... the term mental disorder unfortunately implies a distinction between “mental” disorders and “physical” disorders that is a reductionistic anachronism of mind/body dualism. A compelling literature documents that there is much “physical” in mental disorders and much “mental” in physical disorders.*

– American Psychiatric Association (DSM-IV-TR, 2000)

## Introduction

Perhaps no condition better illustrates the intimate relationship between brain and behavior – mind and body – as the inner experience of fear. In this chapter, we present an integrative scientific view of anxiety and clinical anxiety disorders, with an emphasis on awareness and acceptance as a foundation for mind/body health. Whereas anxiety-related psychopathology is characterized by a desire to avoid the inner experience of fear, we postulate that practicing mindfulness can promote a wise and accepting relationship with one’s internal cognitive, emotional, and physical experience, even during times of intense fear or worry. Further, we suggest that the “wise relationship” that develops by turning toward fear, anxiety, and panic with stable attention, present focused awareness, acceptance, and self-compassion can promote psychological freedom from persistent anxiety and greater behavioral flexibility.

Mindfulness is a word that refers to a basic human capacity for non-conceptual, non-judging, and present-moment-centered awareness. This awareness arises from intentionally paying attention, from noticing on purpose what is occurring inside and outside of oneself, with an attitude of friendliness and acceptance toward what is happening while it is happening. Mindfulness has been cultivated by human beings using “inner technologies” of meditation in various spiritual contexts for literally thousands of years. In the past 25–30 years, Western medical science has turned increasing attention to the psychological and physical correlates of meditation and mindfulness practices (Walsh & Shapiro, 2006). Modern clinical investigators have joined meditation teachers in offering definitions of mindfulness (see Table 10.1).

**Table 10.1.** Definitions of mindfulness.

Definition	Reference
“the non-judgmental observation of the ongoing stream of internal and external stimuli as they arise.”	Baer (2003)
“self-regulation of attention [and] adopting a particular orientation toward one’s experience in the present moment, an orientation that is characterized by curiosity, openness, and acceptance.”	Bishop et al. (2004)
“friendly, nonjudging, present-moment awareness.”	Brantley (2003)
“awareness, of present experience, with acceptance.”	Germer (2005)
“the awareness that emerges through paying attention on purpose, in the present moment, and nonjudgmentally to the unfolding of experience moment by moment.”	Kabat-Zinn (2003)
“the state of being fully present, without habitual reactions.”	Salzberg and Goldstein (2001)

*Our central thesis in this chapter is that practicing mindfulness offers a healthier and more effective means for relating to one’s inner experience of fear and anxiety, through self-regulation built on intentional, non-judging awareness.*

In the sections that follow, we present current theoretical, scientific, and clinical evidence in support of our hypothesis that practicing mindfulness enables a “wise relationship” to develop toward one’s own inner life, particularly the internal experience of anxiety and fear. By bringing inner processes of thinking, feeling, and physical sensations into consciousness using mindfulness practice, identification with and perpetuation of unconscious patterns in mind and body can be transformed into interactions that are “wise”, that is, based in accurate perception and inclusive of all the domains of experience available to each human being in each moment. The healing benefits of mindfulness practice to the conditions of anxiety and fear follow from this more conscious, wise relationship.

### **Prevalence, Characteristics, and Current Treatment of Anxiety Disorders**

Human anxiety occurs along a continuum, from normal fear reactions that help avert clear and present danger to uncontrollable panic and maladaptive avoidance of people, places, and things in an effort to feel safe from harm. The experience of acute fear and mild-to-moderate anxiety is ubiquitous in the human condition. When it occurs in the appropriate context, some fear and anxiety can increase attention to threatening circumstances or enhance effective performance in the face of a challenge. Thus, some degree of anxiety is good.

However, when anxiety is unwarranted, excessive, and persistent, and/or it interferes with everyday functioning, it can be categorized as a psychiatric disorder (American Psychiatric Association, 2000). The Diagnostic and Statistical Manual of Mental Disorders, 4th edition, Text Revision (DSM-IV-TR) includes six primary anxiety disorders (see Table 10.2). Each anxiety disorder shares characteristic symptoms of intrusive and disturbing thoughts,

**Table 10.2.** Primary anxiety disorders, clinical descriptions, and lifetime prevalence.

<b>Diagnostic category</b>	<b>Clinical description</b>	<b>Lifetime prevalence*</b>
Generalized anxiety disorder	Persistent, pervasive worry that is difficult to control	5%
Obsessive-compulsive Disorder	Obsessive thinking about possible threats to safety and compulsive ritualistic behaviors to allay fear	2.5%
Panic disorder	Sudden, overwhelming, intense fear of something going wrong	1.0-3.5%
Post-traumatic stress disorder	Intrusive thoughts, hyperarousal, and reexperience of past trauma	8%
Social anxiety disorder	Fear of negative social evaluation	Up to 13%
Specific phobia	Fear of a specific object or situation	7-11%

\*Obtained from DSM-IV-TR, American Psychiatric Association (2000).

heightened psychophysiological arousal, and intensely unpleasant appraisals of one's internal emotional experience (Brantley, 2003). Taken together, anxiety disorders are the most prevalent category of mental health diagnoses, affecting an estimated 25–30 million Americans during their lifetime (Lepine, 2002; Narrow, Rae, Robins, & Regier, 2002).

Anxiety disorders are often conceptualized as a *fear of fear* that results in high levels of subjective distress, somatic symptom manifestation, and disruption of daily living (Barlow, 2002). Worry has been described as the persistent activation of one's cognitive representation of anxiety, including disturbing thoughts, stories, or images about a possible danger or threat (Borkovec, Ray, & Stober, 1998). Despite its useful function in helping one to cope, feel safe, and prepare for what may come, persistent worry and its associated affective distress and physiological arousal can produce defensive, self-protective, and avoidant behavior out of context, typical of psychiatric disorder (Barlow, 2002; Borkovec et al., 1998).

### **The Psychobiological Nature of Fear and Anxiety**

The psychological experience of fear occurs concomitantly with a pattern of stress-related physiological activation designed to promote survival by avoiding danger through fight-flight-or-freeze behavior (Barlow, 2002). A startle response initiated by sensory detection of a potentially threatening stimulus, such as a sudden loud noise, a looming shadow, or an unexpected touch, immediately signals the subcortical structures in the brain (i.e., the limbic system) that perceive threat and mediate an alarm reaction. This alarm reaction descends from the limbic system through the brainstem, spinal cord, and peripheral nervous system, ultimately activating a broad-spectrum physiological response throughout the body. Integrated psychophysiological activation in response to a perceived threat enables one to cope through vigorous defensive action, such as fighting or fleeing (Schneiderman & McCabe, 1989). These adaptive responses are generated by activation of multiple body systems, including the central and peripheral nervous systems, cardiovascular

system, endocrine system, metabolic system, neuromuscular system, and immune system (Selye, 1976). Conversely, select biological systems unessential for survival in the face of an immediate threat, including the digestive system and the reproductive system, are deactivated under conditions of fear or stress (Selye, 1976).

Psychophysiological activation and accompanying energy mobilization is certainly useful in supporting escape behavior when actual escape is possible. When a threat outweighs one's perceived ability to escape or otherwise cope, however, behavioral freezing and cognitive hypervigilance may occur in an attempt to passively avoid harm (Schneiderman & McCabe, 1989). Under conditions of passive avoidance rather than active coping or escape, the physiological effort and energy generated can go unused. While acute, time-limited onset and recovery of stress-related mental and physical activation clearly provides an adaptive advantage in the face of a true threat (i.e., when actual fighting, fleeing or freezing is needed to promote survival), chronic or unwarranted activation of fear-related psychophysiology can be detrimental to health. Indeed, a growing body of animal and human research indicates that repeated, exaggerated, or prolonged activation of stress physiology, as well as delayed recovery of biological responses to stress, can contribute to premature breakdown of organ systems that may increase susceptibility to disease (McEwen, 1998).

### **Mind/Body Connections and Processes Underlying Clinical Anxiety**

Anxiety disorders can be characterized by a set of dysregulated cognitive, affective, physiological, and behavioral processes that manifest as maladaptive ways of responding to one's inner experience of fear. Dysregulated cognitive processes in anxiety disorders typically include the following:

- a narrow focus of attention on some disturbing aspect of internal experience, such as a distressing thought or physical sensation,
- misappraisal of threat in the absence of real danger, and
- distortion of the magnitude of a true threat or challenge through magnifying, catastrophizing, or fortune telling (Barlow, 2002).

In addition, from a cognitive standpoint, anxiety disorders can be characterized by a focus of attention on future-oriented concerns about possible misfortune (Barlow, 2002). The narrow focus of attention on disturbing thoughts or physical sensations, coupled with a future-oriented tendency to worry about *potential* threats of harm, can predispose an individual to a lack of awareness of what is actually happening in the present moment (Brantley, 2003).

When one is unaware of what is actually happening in the present moment, one's attentional focus is more susceptible to being hijacked by a train of cognitive interpretations about one's experience that may be inaccurate and distress provoking. For instance, in the case of depression, the "downward spiral" of automatic, negatively biased information processing, or "depressogenic thinking," can transform momentary emotional distress into longer-lasting mood disturbance, which in turn, can increase susceptibility to depressive relapse (Segal, Williams, & Teasdale, 2002). Similarly, in the case of anxiety, a cognitive style marked by a narrow focus of attention,

orientation to future events as opposed to present moment experience, and a propensity to catastrophically appraise or misinterpret mental or physical phenomena can result in the arousal of anxiety and other emotional disturbances such as anger, sadness, and loneliness.

While the perception of fear and anxiety occurs in the brain, the response can be most noticeable in the body. The induction of fear and other forms of negative affect stimulates widespread sympathetic activation, which originates from pathways in the cerebral cortex and subcortical limbic structures (e.g., amygdala, hippocampus, hypothalamus), and descends through the brainstem, spinal cord, and peripheral sympathetic nerves to organ systems throughout the body (Thayer & Brosschot, 2005). Consequently, fearful cognitive interpretations and associated emotional and physiological arousal can manifest in an array of somatic symptoms, including painful muscle tension, racing pulse, elevated blood pressure, cardiac arrhythmia, labored respiration, and gastrointestinal disturbance. Moreover, given one's anxiety-prone cognitive style, somatic symptoms can be interpreted as evidence of harm, which may result in even narrower attention to the symptoms, catastrophic thinking, acute panic, emotional distress, and even a sense of impending doom. Because these internal experiences are unpleasant and aversive, they are typically avoided by actively attempting to distract attention away from the inner experience when it is present and attempting to prevent recurrent anxiety in the future by avoiding associated people, places, or things. Taken together, it has been noted that "reactions (both cognitive and emotional) to one's own internal experiences (thoughts, feelings, bodily sensations) may underlie the development and/or maintenance of anxiety disorders," which categorically manifest as psychological and behavioral inflexibility (Orsillo, Roemer, & Holowka, 2005).

### **Overview of Current Treatments for Anxiety**

Given the integrated mind/body nature of fear and experiential anxiety, it is logical that effective treatment strategies for anxiety disorders address both mental and physical functioning. Standard treatment approaches for clinical anxiety include psychotherapy and medication, both of which are intended to modulate cognitive, affective, physiological, and/or behavioral reactions to perceived threat (American Psychiatric Association, 2005). Several different psychotherapies and medications are equally efficacious in the short-term amelioration of anxiety-related symptoms (American Psychiatric Association, 2005). Effective psychotherapies include behavior therapy in which an individual is systematically exposed to a feared condition without being permitted to engage in an automatic, avoidant behavioral response, and cognitive-behavioral therapy (CBT), in which distorted beliefs, misappraisals, contextually inappropriate emotional reactions, and inflexible behavior patterns are identified and corrected using self-monitoring, cognitive restructuring, and relaxation training (for detailed reviews see Barlow, 2002). CBT for anxiety has demonstrated to be superior to medication for long-term symptom reduction (Otto, Smits, & Reese, 2005). There are many "active ingredients" in psychotherapeutic approaches to anxiety disorders, and it remains unclear to what extent specific cognitive, affective, behavioral, or psychoeducational components account for therapeutic change, as opposed to

non-specific factors such as therapist attention, empathy and positive regard, or perceived social support (Barlow, 2002). Effective medications for the treatment of clinical anxiety include benzodiazepines, tricyclic antidepressants, monoamine oxidase inhibitors, and selective serotonin reuptake inhibitors (Sheehan & Harnett Sheehan, 2007). In chronic and/or treatment refractory cases, psychotherapy may be effectively combined with pharmacotherapy (Sheehan & Harnett Sheehan, 2007).

In recent years, mindfulness- and acceptance-based approaches have been combined with traditional change-based approaches such as CBT in an attempt to enhance effective treatment of psychopathology, including anxiety and depressive disorders (for reviews see Feldman, 2007; Hayes, 2005; Lau & McMain, 2005; Orsillo & Roemer, 2005; Segal et al., 2002). Because individuals who experience clinically relevant anxiety typically have a strongly conditioned desire to avoid distressing internal experiences – despite the tendency of experiential avoidance to prolong or even exacerbate distressing sensations – mindfulness practice offers a fundamentally different orientation in which anxiety is deliberately noticed, allowed, and responded to with openness, curiosity, and acceptance. Therefore, practicing mindfulness may increase distress tolerance, interrupt habitual avoidance, and ultimately promote adaptive self-regulation and healthy mind/body functioning.

### **How Mindfulness May Target the Shared Roots of Anxiety-Related Suffering**

Modern-day responses to psychological stress, fear, and uncertainty are often marked by rumination, worry, anticipatory anxiety, and stagnant deliberation. These habits of thinking continue to stimulate fear reactions in the body, which in turn, feed back to fuel worried thoughts, causing a cycle of unpleasant experience (Brosschot, Gerin, & Thayer, 2006; Feldman, Hayes, Kumar, Greeson, & Laurenceau, 2007). Consequently, one might say that human beings today are more likely to fight the *unpleasantness* of their own inner experience of threat rather than fight off the threat itself. In the short term, strategies for avoiding one's inner experience of anxiety, such as distraction, thought suppression, or the use of emotion-regulating substances including cigarettes, alcohol, illicit drugs or food, may be effective in reducing distress temporarily. This behavioral approach can certainly be reinforcing, and thus can become quite habitual, automatic, and rigid. However, attempts to avoid the inner experience of fear, anxiety, and panic not only fail to ameliorate the root cause of emotional upset, but also paradoxically exacerbate the inner experience of suffering by reinforcing maladaptive (i.e., avoidant) coping behaviors that permit an emotionally upsetting experience to recur indefinitely outside of an appropriate context.

#### **Knowing Without Identifying or Reacting**

From the perspective of mindfulness, thoughts, emotions, physical sensations, and impulses that arise in association with one's internal experience of fear, anxiety or panic are merely events in the broad field of one's present-moment awareness (Brantley, 2003). Mindfulness practice is believed to

improve effective self-regulation of anxiety-related cognition, emotion, sensation and behavior, although the precise mechanisms are not yet clear (Baer, 2003; Bishop, 2002; Garland, 2007; Kabat-Zinn, 1990; Shapiro, Carlson, Astin, & Freedman, 2006; Shapiro, & Schwartz, 2000).

Central to the self-regulatory capacity of mindfulness is a fundamental shift in one's relationship with one's inner life and the outer world. In essence, mindfulness enables conscious awareness of inner life and physical sensations. This shift in awareness brought about by mindfulness has variably been termed "reperceiving," "decentering," "detachment," "metacognitive awareness," "bare attention," and "clear seeing" (Salzberg & Goldstein, 2001; Segal et al., 2002; Shapiro et al., 2006; Teasdale et al., 2002). Shapiro et al. (2006), for instance, have described reperceiving as "rather than being immersed in the drama of our personal narrative or life story, we are able to stand back and simply witness it."

The capacity for mindfulness - and its resultant perspective shift on the inner life - is traditionally cultivated by regular meditation practice (Hahn, 1976; Kabat-Zinn, 1990; Salzberg & Goldstein, 2001; Brantley, 2003). Meditation can be understood as an intentional training of attention, embedded with acceptance, and the resulting awareness and understanding that emerge (Brantley, 2003). As observed by Goleman (1980), "The first realization in 'meditation' is that the phenomena contemplated are distinct from the mind contemplating them."

Walsh and Shapiro (2006) have emphasized that meditation training typically differs from other self-regulatory strategies such as self-hypnosis, visualization, and psychotherapy in that meditation primarily aims to train attention and awareness, whereas other approaches primarily intend to change mental contents (i.e., thoughts, images, beliefs, emotions) and modify behavior. Although mindfulness has been described as the "heart of Buddhist meditation," being mindful is considered an innate human capacity that is universal, secular, and compatible with nearly every major world religion (Kabat-Zinn, 2005). Indeed, mindfulness and the ability to reperceive are conceptualized as part of a developmental process (Shapiro et al., 2006).

From a meditation teacher's perspective, practicing mindfulness may help in the following way. As one pays attention on purpose to one's actual direct experience of anxiety, as opposed to being identified with what one *thinks* about anxiety, one gains significantly greater understanding and insight about the experience of anxiety and about oneself in relation to one's world (Goldstein, 1976). Such understanding and insight can provide a foundation for more skillful responses in the face of fear, anxiety and panic, including equanimity rather than reactivity and wise self-regulation rather than aversion. By virtue of the psychological and behavioral flexibility mindfulness can afford in the present moment, one might be better able to consciously choose actions that are effective in meeting one's needs for safety, a sense of security, and calm.

### **"How Are You Treating Anxiety?" Establishing Wise Relationship**

Put simply, distress seems to increase as we stray further from the present moment. As Mark Twain, a famous worrywart, once said, "There has been much tragedy in my life; at least half of it actually happened." The

consequences for psychological suffering are clear when we live in the future. Moreover, reflexively and rigidly attempting to avoid one's inner experience of fear, anxiety, and panic not only fails to address the problem, but actually functions to exacerbate it and prolong suffering. But, what happens when one deliberately takes a different relationship to one's inner life experience? A more conscious and allowing relationship? Can such an act of intention, attention, and acceptance increase one's awareness of the mind/body connection, including implications for self-regulation, wise action, and optimal health?

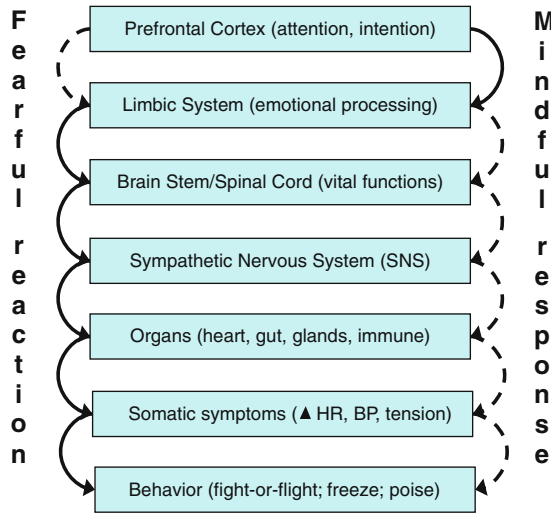
When one changes their relationship to their internal experience from that of automatic judgment, rigid thinking, and disconnection to one of acceptance, openness, and intentional connection, an immediate impact occurs in the circuits and feedback loops of mind and body. Because mindfulness represents a completely different perspective than the prevailing Western cultural norm of narrowly focused attention, avoidance of unpleasantness, and behavioral reactivity contingent on environmental circumstances, it has been described as an "orthogonal rotation" in consciousness (Kabat-Zinn, 2005).

Many mindfulness teachers emphasize that practicing mindfulness is an invitation to relate to life differently. In more practical terms, mindfulness may be described as an intentional willingness to fully and completely engage with one's direct experience of living, on a moment-to-moment basis, with whatever pleasant, unpleasant, or neutral events that arise. The central goal of living mindfully is to open to the fullness and richness of each moment, and not to add, subtract, or modify any part of one's psychological or physical experience. At its core, mindfulness is intended to help one live a life of deep meaning, value, direction, and purpose even when emotional or physical pain is present (Kabat-Zinn, 2003). By awakening to the possibilities available in the present moment, one often becomes empowered to choose a wise response in the face of an upsetting internal experience or external event, as opposed to having an upsetting experience or event dictate how one responds.

### **Scientific Evidence to Support Mindfulness as a Model Self-Regulatory Mechanism**

Mindfulness enables one to establish a radically different relationship to one's experience of internal sensations and outer events by cultivating present-moment awareness based on an attitude of allowance and a behavioral orientation based on wise responsivity rather than automatic reactivity. As shown in Figure 10.1, mindfulness offers an alternative response to the reactive elements of fear and anxiety in the mind and body. By purposefully engaging higher order mental functions, including attention, awareness, and attitudes of kindness, curiosity and compassion, mindfulness may effectively activate control over emotional reactions via cortical inhibition of the limbic system. Mindfulness practice, therefore, not only offers a new way of seeing, a new way of being, in relationship to one's interior life and external world, but also provides a possible means for effective self-regulation of the mind/body connection (Kabat-Zinn, 2005, 1994, 1990).





**Figure. 10.1.** An automatic reaction versus a mindful response to the inner experience of fear. In the case of a fearful reaction, higher-order thinking centers in the prefrontal cortex are taken “offline” (dashed line on left) so that one’s mind/body experience is dictated by activation of the subcortical limbic system. Unencumbered by conscious thought, activation of fear circuitry in the limbic system stimulates sympathetic nerves that originate in the brain stem, descend through the spinal cord, and innervate internal organs to prepare the body for vigorous defensive behavior (e.g., “fight-or-flight”; solid lines on left). In the case of anxiety disorders, one’s perception of threat may be greatly magnified or completely imagined. In this context, mindfulness, including paying attention on purpose to one’s internal experience in the present moment, may activate prefrontal cortex areas to come “online” (solid line on right), which in turn, can inhibit reactive emotional circuitry, fear-related physiological arousal, and automatic behavior (dashed lines on right).

Considerable data support the rationale for a model of conscious, accepting attention to unfolding mind/body experiences as a skillful self-regulatory process. A brief review of several psychological and biological pathways through which mindful attention, awareness, and attitudes may influence brain and body functioning follows.

First, mindfulness practice may increase one’s ability to maintain a stable focus of attention that is intentional and chosen, as opposed to automatically driven or hijacked by emotional reactivity (Jha, Krompinger, & Baime, 2007). Consequently, one may be more likely to avoid maladaptive, unconscious patterns of anxiety-producing thinking, including perseveration on upset, unpleasantness, or discomfort. Many forms of perseverative cognition, including worry, anticipatory anxiety, and rumination are associated with increased sympathetic arousal and dysregulated (persistently activated) cardiovascular, neuroendocrine, metabolic, neuromuscular, and immune processes (Brosschot et al., 2006; Brosschot, Pieper, & Thayer, 2005; Thayer & Brosschot, 2005). Notably, trait mindfulness has been associated with lower levels of worry, rumination, thought suppression, experiential avoidance, and stagnant deliberation (Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006a; Feldman et al., 2007). In addition, formal training in mindfulness meditation has produced significant reductions in the tendency to ruminate and to problem-solve using an inflexible cognitive style (Feldman, Hayes,

& Greeson, 2006; Jain et al., 2007; Ramel, Goldin, Carmona, & McQuaid, 2004). Based on these shifts in attention, awareness, and cognitive processing, one might also expect mindfulness to correlate with decreased physiological arousal and somatic symptom manifestation.

A second line of scientific inquiry for the self-regulatory capacity of mindfulness practice involves the investigation of autonomic nervous system regulation. Preliminary evidence for such regulation was recently demonstrated by a study in which mindful body scan meditation produced greater parasympathetic activation than progressive-muscle relaxation (Ditto, Eclache, & Goldman, 2006). In a different study, practice of a mindful body scan meditation immediately prior to a standardized psychosocial stress task was associated with normal stress-related activation of the hypothalamic-pituitary-adrenal (HPA) axis among medical students trained in mindfulness-based stress reduction (Greeson, Rosenzweig, Vogel, & Brainard, 2001). In addition to possible attenuating effects on stress-related physiological activation, mindfulness and meditation may also induce a relaxation response, characterized by relaxed alertness, passive disregard for internal stimuli or external events, and low-level physiological arousal (Benson & Klipper, 1975).

A third line of scientific inquiry into the self-regulatory effects of mindfulness practice is the rapidly growing field of contemplative neuroscience. This burgeoning area of investigation is beginning to reveal some of the ways in which paying attention on purpose, cultivating inner attitudes of acceptance and non-judgment, and setting meaningful intentions such as to direct lovingkindness toward oneself or others can actually modify brain activity, including perception, higher order cognition, and emotion regulation (Cahn & Polich, 2006; Siegel, 2007; Wallace, 2006). One recent analysis based on a comprehensive review of the current scientific literature spanning neuroscience and meditation concluded that neural plasticity may indeed enable humans, including adults, to gradually transform mindful *states* into *traits* based on repeated exposure to experiential shifts in perspective, emotional processing, and behavioral responses (Begley, 2007). A landmark clinical intervention study by Davidson, Kabat-Zinn et al. (2003) demonstrated for the first time that systematic mindfulness training in a real-world setting can produce observable changes in the brain, namely greater left prefrontal activation, which has previously been associated with positive emotion. Of particular interest, the study by Davidson, Kabat-Zinn et al. (2003) further revealed a connection between change in the brain, and change in the body, as greater intervention-related shifts toward left prefrontal activation corresponded with more vigorous antibody responses to influenza vaccination. The connection between changes in central nervous system activity and peripheral immune function is well established (Ader, 2007). Two very recent examples of the power of the mind to change the brain include modification of attentional subsystems following eight weeks of group-based mindfulness meditation training (Jha et al., 2007), as well as enhanced prefrontal cortex regulation of affect through labeling negative emotions, a core mindfulness skill (Creswell, Way, Eisenberger, & Lieberman, 2007).

Finally, behavioral scientific evidence suggests that mindfulness practice can positively impact health-related behaviors through its effects on cognitive, affective, and physiological self-regulation. Specifically, mindfulness practice appears to increase behavioral flexibility in conditions previously associated with maladaptive rigidity, such as fear-related avoidance of

normal everyday activities. A “third wave” of behavioral psychotherapies has recently emerged in which mindfulness- and acceptance-based approaches have been combined with traditional cognitive-behavioral treatment of anxiety and other emotionally dysregulated conditions, including depression, chronic pain, eating disorders, and borderline personality disorder (Baer, Fischer, & Huss, 2006b; Hayes, 2005; Lau & McMain, 2005). These new integrated psychotherapies include mindfulness-based cognitive therapy (MBCT) for active depression and anxiety as well as the prevention of depressive relapse (Finucane & Mercer, 2006; Segal et al., 2002); acceptance and commitment therapy (ACT) for anxiety disorders and chronic pain (Eifert & Forsyth, 2005; Dahl, Wilson, Luciano, & Hayes, 2005); dialectical behavior therapy (DBT) for borderline personality disorder (Linehan, 1993); and mindfulness-based eating awareness training (MB-EAT) for binge eating disorder (Kristeller, Baer, & Quillian-Wolever, 2006). The primary objective of integrating mindfulness meditation with traditional CBT is to increase treatment efficacy by exploring the relationship between acceptance of one’s present moment experience as a catalyst of desired behavior change, including modification of self-destructive ways of thinking, feeling, and acting (Lau & McMain, 2005).

There is a burgeoning literature to support the integration of mindfulness- and acceptance-based strategies with traditional change-based strategies in the treatment of anxiety disorders in particular. This area of clinical investigation has recently been reviewed in special journal issues, professional handbooks, and practitioner’s treatment guides (for detailed reviews see Borkovec, 2002; Craske & Hazlett-Stevens, 2002; Eifert & Forsyth, 2005; Germer, 2005; Orsillo & Roemer, 2005; Roemer, Salters-Pedneault, & Orsillo, 2006; Roemer & Orsillo, 2002; Wells, 2002). In addition, several literature reviews have concluded that mindfulness-based stress reduction programs in both controlled research and real-world community settings have produced clinically significant reductions in anxiety, mood disturbance, and stress-related physical symptoms (Baer, 2003; Brantley, 2005; Grossman, Niemann, Schmidt, & Walach, 2004; Lazar, 2005; Shigaki, Glass, & Schopp, 2006; Smith, Richardson, Hoffman, & Pilkington, 2005).

Whereas a number of different mindfulness-based clinical interventions have demonstrated effectiveness in ameliorating maladaptive cognition, negative affect, and somatic symptoms, one should note that the core intention of mindfulness practice centers around personal growth, transformation, and the pursuit of what is possible, meaningful, and truly valued in life despite any particular diagnosis, limitation, or pathology (Shapiro, Schwartz, & Santerre, 2002). By virtue of progressively awakening to one’s senses, core values, intended life direction, and even spiritual purpose, mindfulness practice may be effectively coupled with other positively oriented behavior-change interventions like hypnosis to further increase contact with what is affirming, comforting, and fulfilling (Lynn, Das, Hallquist, & Williams, 2006).

## Illustrative Case Report

**Background:** “John” is 25-year-old, single, Caucasian male graduate student with an 18-month history of treatment refractory hypertension, non-cardiac chest pain, and irregular heartbeat. He was referred for psychotherapeutic

management of anxiety and recurrent panic attacks. Extensive biomedical workup prior to psychotherapy revealed no known medical cause for his physical or psychological symptoms, which were consistent with a diagnosis of panic disorder. Hypertension was reportedly non-responsive to combination treatment with a beta-blocker (Toprol XL) and diuretic (hydrochlorothiazide; average blood pressure reading before and after medication = 145/95). The client reported that healing touch, breathwork with heart rate variability (HRV) biofeedback, and yoga instruction had been “somewhat beneficial” in reducing physical symptoms and anxiety, but not blood pressure. Several months of individual counseling for the treatment of anxiety and panic was reportedly “not helpful.” Current self-care activities included yoga 5 days per week, running 1 day per week, avoiding foods with processed sugar and added sodium, eating more fruits and vegetables, and nightly deep breathing with sound therapy. The client denied illicit substance use and reported minimal alcohol use (1 drink per month). Family psychiatric history was significant for anxiety in mother and father.

**Intervention:** Nine individual therapy sessions, which included a combination of formal mindfulness training, anxiety-specific cognitive-behavioral skills training, and supportive psychotherapy to aid the client in clarifying his vision of optimal health, wholeness, and life direction. Treatment goals included the following: (1) ability to tolerate distressing physical symptoms without panic, (2) reduction in muscle tension, including chest pain, and (3) reduction in blood pressure. Each session emphasized formal mindfulness meditation practice (i.e., awareness of breath; body scan; mindfulness of thoughts, feelings, physical sensations, and sounds), cognitive-behavioral strategies to reduce anxiety and related physiological symptoms (e.g., cognitive restructuring, exposure therapy with response prevention), and self-help readings to reinforce learning and to provide structured mindfulness-based exercises (e.g., the book *Calming Your Anxious Mind*). In-session meditation practices were recorded for home use. During the course of treatment, “John” stated that he experienced a shift in his relationship to worrisome thoughts, noting that “[his] feelings are temporary.” In addition, “John” stated that he was “not focusing on what *could* happen, but focusing on what *is* happening.” The client further described a shift in his relationship to “strange pains” and other unpleasant physical sensations, noting that “[his] experience of chest tightness dissipated with allowance.” Notably, “John” did not experience a panic attack during his 9 weeks of therapy, which he attributed to the shifts in perspective he experienced. Midway through therapy, he described feeling “a bit nervous, but okay” in situations that he typically feared and avoided, such as flying and being outdoors in remote areas. By the end of treatment, “John” had experienced a significant reduction in self-reported levels of anxiety and muscle tension, as well as a decrease in blood pressure readings following his regular yoga, breathwork, and mindfulness exercises. He insightfully reported discovering how to “be in control by letting go.” Moreover, “John” was no longer avoiding formerly feared social situations. He reported actively engaging with co-workers, community members, and spiritual guides. And at the final session he enthusiastically shared that he had become engaged to his long-time girlfriend, because “[he] was no longer afraid.” Taken together, the multimodal intervention approach with

mindfulness as a core self-regulatory skill resulted in marked improvements the client's quality of life, including mental, physical, and social functioning.

### **Illustrative Mindfulness Practice: “Awareness of Breath”**

Paying attention on purpose to your breath sensations is an effective way to reconnect with your inner experience as it is unfolding moment to moment.

- (1) Notice and follow the full duration of an in breath. . .an out breath. . .and the spaces between them. . .
- (2) Noticing the physical sensations of the breath with a sense of curiosity and kind attention. . .allowing the sensations to unfold moment to moment. . .breath by breath. . .observing as best you can. . .
- (3) Noticing whether your attention is on the breath in this moment. . .and if it is not, where did the mind go. . .perhaps it began thinking, telling some sort of story about your experience, or analyzing. . .just noticing these thoughts or judgments as mere events in the field of your own spacious awareness. . .
- (4) Noticing the transient nature of these mental events as you continue to surf the rising and falling waves of the in breath and the out breath. . .consciously choosing to acknowledge and let go of thoughts, feelings, body sensations, or impulses with the next exhale. . .
- (5) Gently escorting your attention back to your focus on the present moment. . .using the sensations of the breath as your anchor for mindfulness. . .dropping back into your direct experience of what is here in the present moment whenever you choose. . .
- (6) And whenever you are ready, reorienting to the room. . .noticing where your body makes contact with the furniture. . .perhaps stretching gently. . .and gradually opening your eyes.

### **Future Directions**

A growing body of scientific literature demonstrates that mindfulness- and acceptance-based treatment approaches to anxiety work, in part by creating a fundamental shift in perspective toward one's inner life. Much work, however, remains to be done across conceptual, definitional, and research fronts applied to mindfulness-based interventions for fear and anxiety. In addition, there is theoretical and empirical support for the concept that paying attention on purpose to the inner experience of fear and anxiety with a sense of openness, curiosity, and acceptance can actually change one's experience by directly modifying habitual circuits and mind/body feedback loops in the brain. Additional research is needed to examine more deeply the aspects of consciousness, including awareness, attention and intention, which may be used to effectively self-regulate mind-brain-body-behavior systems implicated in anxiety and anxiety disorders. Questions that await further inquiry include: Who benefits most (and least) from mindfulness training in the context of clinical anxiety? How can mindfulness training be integrated most effectively with existing evidence-based treatment approaches, including CBT and/or medication? And finally, what is the role that institutions and

communities may play in facilitating the development of greater mindfulness, individually, and collectively?

## Conclusion

Human beings have the capacity for accurate, present-moment awareness of the flow of their inner life. Mindfulness is a name for this accepting and accurate awareness. Mindfulness arises from paying attention on purpose. Practicing mindfulness appears to complement and enhance established psychotherapeutic approaches to the treatment of anxiety and underlying mind/body dysregulation. Taken together, mindfulness practice appears to offer a healthy and effective means of relating to one's inner experience of fear and anxiety, in part through cultivating the ability to pay attention on purpose with an open, curious, and accepting attitude toward oneself and one's outer world. This "wise relationship" offered by mindfulness practice may help ease the suffering of excessive fear, anxiety or panic by encouraging an individual to "reperceive" the transient conditions of internal discomfort by maintaining equanimity as one's experience unfolds, moment by moment. Using the higher-order skill of "metacognitive awareness," one may more easily perceive unpleasant internal stimuli or external events simply as they are, without creating a story about one's present-moment experience that can fuel perseverative thinking, upsetting feelings, disconcerting physiological arousal, and reactive behavior in an attempt to avoid distress. With practice, as automatic reactions are deliberately acknowledged and let go and consciously chosen behavioral responses are selected, one begins to realize increasing wisdom, psychological freedom, and behavioral flexibility. These characteristics afforded by mindfulness practice define healthy, adaptive mental functioning, which includes acknowledging fear and anxiety, but does not allow fear to control or distort one's life.

## References

- Ader, R. (Ed.). (2007). *Psychoneuroimmunology* (4th ed.), Vol. 1. San Diego, CA: Academic Press.
- American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (DSM-IV, 4th ed., text revision). Washington, DC: American Psychiatric Association.
- American Psychiatric Association. (2005). *Let's talk facts about anxiety disorders*. Available at <http://www.HealthyMinds.org>
- Baer, R. A. (2003). Mindfulness training as a clinical intervention: A conceptual and empirical review. *Clinical Psychology: Science and Practice*, 10, 125-143.
- Baer, R. A., Fischer, S., & Huss, D. B. (2006b). Mindfulness and acceptance in the treatment of disordered eating. *Journal of Rational-Emotive & Cognitive-Behavior Therapy*, 23, 281-300.
- Baer, R. A., Smith, G. T., Hopkins, J., Krietemeyer, J., & Toney, L. (2006a). Using self-report assessment methods to explore facets of mindfulness. *Assessment*, 13, 27-45.
- Barlow, D. H. (Ed.). (2002). *Anxiety and its disorders: The nature and treatment of anxiety and panic* (2nd ed.). New York: Guilford.

- Begley, S. (2007). *Train your mind, change your brain: How a new science reveals our extraordinary potential to transform ourselves*. New York: Ballantine.
- Benson, H., & Klipper, M. Z. (1975). *The relaxation response*. New York: HarperCollins.
- Bishop, S. D. (2002). What do we really know about mindfulness-based stress reduction? *Psychosomatic Medicine*, *64*, 71-83.
- Bishop, S. R., Lau, M., Shapiro, S., Carlson, L., Anderson, N. D., Carmody, J., et al. (2004). Mindfulness: A proposed operational definition. *Clinical Psychology: Science and Practice*, *11*, 230-241.
- Borkovec, T. D. (2002). Life in the future versus life in the present. *Clinical Psychology: Science and Practice*, *9*, 76-80.
- Borkovec, T. D., Ray, W. J., & Stöber, J. (1998). Worry: A cognitive phenomenon intimately lined to affective, physiological, and interpersonal behavioral processes. *Cognitive Therapy and Research*, *22*, 561-576.
- Brantley, J. (2003). *Calming your anxious mind: How mindfulness and compassion can free you from anxiety, fear, and panic*. Oakland, CA: New Harbinger.
- Brantley, J. (2005). Mindfulness-based stress reduction. In S. M. Orsillo, & L. Roemer (Eds.), *Acceptance and mindfulness-based approaches to anxiety* (pp. 131-145). New York: Springer.
- Brosschot, J. F., Gerin, W., & Thayer, J. F. (2006). The perseverative cognition hypothesis: A review of worry, prolonged stress-related physiological activation, and health. *Journal of Psychosomatic Research*, *60*, 113-124.
- Brosschot, J. F., Pieper, S., & Thayer, J. F. (2005). Expanding stress theory: Prolonged activation and perseverative cognition. *Psychoneuroendocrinology*, *30*, 1043-1049.
- Cahn, B. R., & Polich, J. (2006). Meditation states and traits: EEG, ERP, and neuroimaging studies. *Psychological Bulletin*, *132*, 180-211.
- Craske, M. G., & Hazlett-Stevens, H. (2002). Facilitating symptom reduction and behavior change in GAD: The issue of control. *Clinical Psychology: Science and Practice*, *9*, 69-75.
- Creswell, J. D., Way, B. M., Eisenberger, N. I., & Lieberman, M. D. (2007). Neural correlates of dispositional mindfulness during affect labeling. *Psychosomatic Medicine*, *69*, 560-565.
- Dahl, J., Wilson, K. G., Luciano, C., & Hayes, S. C. (2005). *Acceptance and commitment therapy for chronic pain*. Reno, NV: Context Press.
- Davidson, R. J., Kabat-Zinn, J., Schumacher, J., Rosenkranz, M., Muller, D., Santorelli, S. F., et al. (2003). Alterations in brain and immune function produced by mindfulness meditation. *Psychosomatic Medicine*, *65*, 564-570.
- Ditto, B., Eclache, M., & Goldman, N. (2006). Short-term autonomic and cardiovascular effects of mindfulness body scan meditation. *Annals of Behavioral Medicine*, *32*, 227-234.
- Eifert, G. H., & Forsyth, J. P. (2005). *Acceptance and commitment therapy for anxiety disorders*. Oakland, CA: New Harbinger.
- Feldman, G. (2007). Cognitive and behavioral therapies for depression: Overview, new directions, and practical recommendations for dissemination. *Psychiatric Clinics of North America*, *30*, 39-50.
- Feldman, G., Hayes, A., Kumar, S., Greeson, J., & Laurenceau, J.-P. (2007). Mindfulness and emotion regulation: The development and initial validation of the Cognitive and Affective Mindfulness Scale-Revised (CAMS-R). *Journal of Psychopathology and Behavioral Assessment*, *29*, 177-190.
- Feldman, G. C., Hayes, A. M., & Greeson, J. M. (2006, November). *Reductions in staggant deliberation during mindfulness training: A pilot study* [Abstract]. Proceedings of the 40th Annual Convention of the Association for Cognitive and Behavioral Therapies, Chicago, IL.

- Finucane, A., & Mercer, S. W. (2006). An exploratory mixed methods study of the acceptability and effectiveness of mindfulness-based cognitive therapy for patients with active depression and anxiety in primary care. *BMC Psychiatry*, 6, 14.
- Garland, E.L. (2007). The meaning of mindfulness: A second-order cybernetics of stress, metacognition, and coping. *Complementary Health Practice Review*, 12, 15-30.
- Germer, C. K. (2005). Anxiety disorders: Befriending Fear. In C. K. Germer, R. D. Siegel, & P. R. Fulton (Eds.), *Mindfulness and psychotherapy* (pp. 152-172). New York: Guilford.
- Goldstein, J. (1976). *The experience of insight: A natural unfolding*. Santa Cruz, CA: Unity Press.
- Goleman, D. (1980). A map for inner space. In R. N. Walsh & F. Vaughan (Eds.), *Beyond ego* (pp. 141-150). Los Angeles: J.P. Tarcher.
- Greeson, J. M., Rosenzweig, S., Vogel, W. H., & Brainard, G. C. (2001). Mindfulness meditation and stress physiology in medical students [Abstract]. *Psychosomatic Medicine*, 63, 158.
- Grossman, P., Niemann, L., Schmidt, S., & Walach, H. (2004). Mindfulness-based reduction and health benefits: A meta-analysis. *Journal of Psychosomatic Research*, 57, 35-43.
- Hahn, T. N. (1976). *The miracle of mindfulness: An introduction to the practice of meditation*. Boston: Beacon.
- Hayes, S. C. (2005). Acceptance and commitment therapy, relational frame theory, and the third wave of behavioral and cognitive therapies. *Behavior Therapy*, 35, 639-665.
- 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, 11-21.
- Jha, A. P., Krompinger, J., & Baime, M. J. (2007). Mindfulness training modifies subsystems of attention. *Cognitive, Affective, & Behavioral Neuroscience*, 7, 109-119.
- Kabat-Zinn, J. (1990). *Full catastrophe living: using the wisdom of your body and mind to face stress, pain, and illness*. New York: Delacorte.
- Kabat-Zinn, J. (1994). *Wherever you go, there you are: Mindfulness meditation in everyday life*. New York: Hyperion.
- Kabat-Zinn, J. (2003). Mindfulness-based interventions in context: Past, present, and future. *Clinical Psychology: Science and Practice*, 10, 144-156.
- Kabat-Zinn, J. (2005). *Coming to our senses: Healing ourselves and the world through mindfulness*. New York: Hyperion.
- Kristeller, J. L., Baer, R. A., & Quillian-Wolever, R. (2006). Mindfulness-based approaches to eating disorders. In R. A. Baer (Ed.), *Mindfulness-based treatment approaches* (pp. 75-91). San Diego, CA: Academic Press.
- Lau, M. A., & McMain, S. F. (2005). Integrating mindfulness meditation with cognitive and behavioural therapies: The challenge of combining acceptance- and change-based strategies. *Canadian Journal of Psychiatry*, 50, 863-869.
- Lazar, S. W. (2005). Mindfulness research. In C. K. Germer, R. D. Siegel, & P. R. Fulton (Eds.), *Mindfulness and psychotherapy* (pp. 220-238). New York: Guilford.
- Lepine, J. P. (2002). The epidemiology of anxiety disorders: Prevalence and societal costs. *Journal of Clinical Psychiatry*, 63 suppl 14, 4-8.
- Linehan, M. M. (1993). *Cognitive behavioral therapy for borderline personality disorder*. New York: Guilford.
- Lynn, S. J., Das, L. S., Hallquist, M. N., & Williams, J. C. (2006). Mindfulness, acceptance, and hypnosis: Cognitive and clinical perspectives. *International Journal of Clinical Hypnosis*, 54, 143-166.



- McEwen, B. S. (1998). Protective and damaging effects of stress mediators. *New England Journal of Medicine*, *338*, 171–179.
- Narrow, W. E., Rae, D. S., Robins, L. N., & Regier, D. A. (2002). Revised prevalence based estimates of mental disorders in the United States: Using a clinical significance criterion to reconcile 2 surveys' estimates. *Archives of General Psychiatry*, *59*, 115–123.
- Orsillo, S. M., & Roemer, L. A. (Eds.). (2005). *Acceptance and mindfulness-based approaches to anxiety: Conceptualization and treatment*. New York: Springer.
- Orsillo, S. M., Roemer, L., & Holowka, D. W. (2005). Acceptance-based behavioral therapies for anxiety. In: S.M. Orsillo & L. Roemer (Eds.), *Acceptance and mindfulness-based approaches to anxiety* (pp. 3–35). New York: Springer.
- Otto, M. W., Smits, J. A. J., & Reese, H. E. (2005). Combined psychotherapy and pharmacotherapy for mood and anxiety disorders in adults: Review and analysis. *Clinical Psychology: Science and Practice*, *12*, 72–86.
- Ramel, W., Goldin, P. R., Carmona, P. E., & McQuaid, J. R. (2004). The effects of mindfulness meditation on cognitive processes and affect in patients with past depression. *Cognitive Therapy and Research*, *28*, 433–455.
- 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 and Practice*, *9*, 54–68.
- Roemer, L., Salters-Pedneault, K., & Orsillo, S. M. (2006). Incorporating mindfulness and acceptance-based strategies in the treatment of generalized anxiety disorder. In R. A. Baer (Ed.), *Mindfulness-based treatment approaches* (pp. 51–74). San Diego, CA: Academic Press.
- Salzberg, S., & Goldstein, J. (2001). *Insight meditation*. Boulder, CO: Sounds True.
- Schneiderman, N., & McCabe, P. M. (1989). Psychophysiologic strategies in laboratory research. In N. Schneiderman, S. M. Weiss, & P. G. Kaufmann (Eds.), *Handbook of research methods in cardiovascular behavioral medicine*. New York, Plenum.
- Segal, Z. V., Williams, J. M., & Teasdale, J. D. (2002). *Mindfulness-based cognitive therapy for depression: A new approach to preventing depressive relapse*. New York: Guilford.
- Selye, H. (1976). *The stress of life* (2nd ed.). New York: McGraw-Hill.
- Shapiro, S. L., Carlson, L. E., Astin, J. A., & Freedman, B. (2006). Mechanisms of mindfulness. *Journal of Clinical Psychology*, *62*, 373–386.
- Shapiro, S. L., Schwartz, G. E. R., & Santerre, C. (2002). Meditation and positive psychology. In C. R. Snyder & S. J. Lopez (Eds.), *Handbook of Positive Psychology* (pp. 632–645). New York: Oxford University Press.
- Shapiro, S. L., & Schwartz, G. E. R. (2000). Intentional systemic mindfulness: An integrative model for self-regulation and health. *Advanced in Mind/body Medicine*, *16*, 128–134.
- Sheehan, D. W., & Harnett Sheehan, K. (2007). Current approaches to the pharmacologic treatment of anxiety disorders. *Psychopharmacology Bulletin*, *40*, 98–109.
- Shigaki, C. L., Glass, B., & Schopp, L. H. (2006). Mindfulness-based stress reduction in medical settings. *Journal of Clinical Psychology in Medical Settings*, *13*, 209–216.
- Siegel, D. J. (2007). *The mindful brain: Reflection and Attunement in the Cultivation of well-being*. New York: W.W. Norton.
- Smith, J. E., Richardson, J., Hoffman, C., & Pilkington, K. (2005). Mindfulness-based stress reduction as a supportive therapy in cancer care: A systematic review. *Journal of Advanced Nursing*, *52*, 315–327.
- 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*, 275–287.

- Thayer, J. F., & Brosschot, J. F. (2005). Psychosomatics and psychopathology: Looking up and down from the brain. *Psychoneuroendocrinology*, *30*, 1050-1058.
- Wallace, B. A. (2006). *Contemplative science: Where Buddhism and neuroscience converge*. New York: Columbia University Press.
- Walsh, R., & Shapiro, S. L. (2006). The meeting of meditative disciplines and Western psychology: A mutually enriching dialogue. *American Psychologist*, *61*, 227-239.
- Wells, A. (2002). GAD, metacognition, and mindfulness: An information processing analysis. *Clinical Psychology: Science and Practice*, *9*, 95-100.