

Mindfulness

A Transtherapeutic Approach for Transdiagnostic Mental Processes

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In the beginner's mind there are many possibilities, but in the expert's there are few.
—(Suzuki, 2010)

Historical Origins of Mindfulness and Implications for Mind–Body Health

Mindfulness as a current topic of academic inquiry derives from two main historical roots: (1) Eastern contemplative psychology embedded in meditation (Germer, 2005; Gunaratana, 2002; Kabat-Zinn, 2011); and (2) Western social psychology (E. J. Langer, 1989). From both a contemplative and a social-psychological perspective, mindfulness concerns freeing oneself from misperceptions, thinking patterns, and self-imposed limitations that impede creativity, clear seeing, and optimal mental and physical health. Moreover, from both the Eastern and Western view, every individual has the intrinsic capacity to be mindful, and with intention and practice, mindfulness can garner strength and stability. In this sense, the greatest potential of mindfulness may emerge when one consciously decides to pursue mindfulness not as just a “tool” in the proverbial toolbox, but as a way of seeing oneself and the world, or a conscious way of being and interacting (Kabat-Zinn, 2005).

In the contemplative tradition, the fundamental shift in perspective associated with mindfulness is called *Beginner's Mind* (Suzuki, 2010); this refers to the meditation practice of remaining open, curious, unattached, and mentally flexible. Hence, meditation practice offers a traditional method for cultivating the core qualities of mindfulness. In Western societies, mindfulness meditation is now taught—using the skills of Beginner's Mind—as a way to relieve suffering associated with stress, pain, and illness (Kabat-Zinn, 1982, 1990, 2011). Jon Kabat-Zinn described the fundamental shift in perspective that comes about through mindfulness meditation practice as an

“orthogonal rotation in consciousness,” since one begins to let go of attachments to ideas, expected outcomes, and desires for things to be different than they are in the moment (Kabat-Zinn, 2005). The flexible quality of mind defined by welcoming uncertainty, deliberately observing habitual patterns of thinking, feeling, and behaving, and focusing on being rather than doing are antithetical to many current Western norms, such as multitasking, productivity, and ubiquitous media connectivity (Kabat-Zinn, 2003). From the Western social-psychological perspective, to live more mindfully does not necessarily require meditation, but it does require a similar shift in consciousness—a new way of seeing—that emerges from direct, personal experience.

Whether the conscious shift toward greater mindfulness comes about through meditation practice or through other means for first-hand insight and realization (e.g., modeling a teacher, a friend, a therapist, or a spiritual guide), the benefits likely develop as a result of two unique steps. The first is to realize one’s attachments to things: ideas, concepts, assumptions, rules, and expectations. The second is to let those attachments go and see things from a new, more flexible and open perspective. From a contemplative and a social-psychological perspective, conceptual attachments, like rumination, narrow one’s thinking, restrict one’s behavior, and limit one’s possibilities, including possibilities for health and well-being (Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008). In contrast, mindfully acknowledging and letting go of automatic, habitual ways of thinking can allow new levels of possibility, creative problem-solving, and learning, which, in turn, can support self-care and mental and physical health (E. Langer, 1989, 1997; E. J. Langer, 2005, 2009). According to Vietnamese Buddhist monk and renowned mindfulness meditation teacher, Thich Nhat Hanh, “We have more possibilities available in each moment than we realize” (quoted in Miller, 2004). Can this newfound insight and energy harnessed from mindfulness translate to better mental health?

As we describe in this chapter, most psychological disorders involve a fundamental problem with inflexibility, lack of insight, or narrowed perspective—that is, *mindlessness*. Recent advances in psychological science, neuroscience, and mindfulness research suggest that mindfulness training can target a variety of mindless mental processes that cut across numerous psychological disorders. These common processes specifically include negative affectivity and emotional reactivity, repetitive negative thinking such as rumination, experiential avoidance, attentional bias, reappraisal, and suppression of thoughts and feelings. Because these repetitive, inflexible, distress-producing ways of thinking, perceiving, and behaving are implicated in many disorders (e.g., anxiety, depression, posttraumatic stress, substance use, sleep disturbance, eating disorders, and chronic pain conditions), such mental processes have been coined “transdiagnostic” (Harvey, Watkins, Mansell, & Shafran, 2004), literally meaning across illnesses. In a paradigmatic shift away from conventional, disorder-specific treatment, there is a new movement toward focusing on transdiagnostic treatment approaches that target a core set of psychopathological processes that seem to underlie many clinical disorders (Barlow et al., 2011; Craske, 2012; Mansell, Harvey, Watkins, & Shafran, 2008; Taylor & Clark, 2009). By reviewing the nature of transdiagnostic mental processes, describing their role in the etiology across psychological disorders, and demonstrating the ways in which mindfulness meditation can help through mindful learning, we propose that an integrated view of Eastern and Western mindfulness may offer a “transtherapeutic” approach to understanding optimal mind–body health.

A Paradigm Shift: Away From Conventional Categories and Toward Functional Processes

What if there were a single approach to mental health that was relatively simple to learn, widely available, applicable to anyone, and effective across a wide range of adverse life conditions? The implications for health, and society, could be profound. Whereas mental-health-care practice and research have evolved toward more and more refined levels of diagnostic specificity and distinction (Kendler, 2009), leaders at the National Institute of Mental Health (NIMH) have recently called for a shift away from classification based on presenting signs and symptoms, and toward more functional, objective assessments of brain function, genetics, and maladaptive behavior (Insel et al., 2010). In theory, the paradigm shift would overcome slowdowns in discovering new treatments and barriers to optimizing patient outcomes by identifying mind–brain–body–behavior processes that, when effectively targeted, could accelerate progress toward better health, for individuals and society. Some of the functional processes include fear/extinction, reward, executive function, and impulse control. According to Insel and colleagues (2010):

the practitioner of the future could supplement a clinical evaluation of what we now call an “anxiety disorder” with data from functional or structural imaging, genomic sequencing, and laboratory-based evaluations of fear conditioning and extinction to determine prognosis and appropriate treatment, analogous to what is done routinely today in many other areas of medicine.

The emergence of functional, transdiagnostic mental processes in the context of a paradigm shift in psychiatric nosology offers a timely opportunity to examine mindfulness as a transtherapeutic approach.

As we present in this chapter, increasing experimental and clinical evidence supports the overarching hypothesis that mindfulness can target core cognitive, emotional, neural, physiological, and behavioral processes implicated in the risk, severity, and relapse of mental disorders. If data continue to accrue, we may be on the threshold of an era in which “personalized mindfulness” could become part of personalized medicine. Previous reviews and meta-analyses have consistently documented the broad mental-health benefits of mindfulness training in both clinical and nonclinical populations (Baer, 2003; Black, Milam, & Sussman, 2009; Bohlmeijer, Prenger, Taal, & Cuijpers, 2010; de Vibe et al., 2012; Eberth & Sedlmeier, 2012; Grossman, Niemann, Schmidt, & Walach, 2004; Hofmann, Grossman, & Hinton, 2011; Hofmann, Sawyer, Witt, & Oh, 2010; Piet & Hougaard, 2011; Vøllestad, Nielsen, & Nielsen, 2012). Other scholars have proposed some of the functional processes that may underlie the effectiveness of mindfulness-based clinical interventions, and that might explain individual differences in outcomes (Baer, 2007, 2009; Chambers, Gullone, & Allen, 2009; Chiesa, Serretti, & Jakobsen, 2013; Garland, Boettiger, & Howard, 2011; Greeson, 2009; Keng, Smoski, & Robins, 2011; Shapiro, Carlson, Astin, & Freedman, 2006; Teasdale et al., 2002).

In the following section, we define a number of transdiagnostic mental processes, describe their functional (pathophysiological) role in mental disorders, explain how mindfulness can target the dysfunction, and review empirical evidence for the

transtherapeutic effect of mindfulness practice. Throughout the examples, we develop a common theme that from the perspective of mindfulness, sometimes “awareness is enough.” We then follow with a separate section that highlights the instrumental role of mindful learning in facilitating healthy psychological change, which is intimately tied to biological, physical, and behavioral change.

Mindfulness as a Transtherapeutic Approach for Transdiagnostic Mental Processes

Negative affectivity and emotional reactivity

The tendency to experience negative emotions, such as anger, fear, sadness, and isolation, pervades most psychological disorders listed in the American Psychiatric Association’s Diagnostic and Statistical Manual (DSM) of Mental Disorders (American Psychiatric Association, 2013). It is normal and healthy to experience a full range of emotions, on a continuum from subtle and fleeting to intense and longer lasting. Psychological disorders, however, typically require “significant distress” (American Psychiatric Association, 2013). Hence, in the current classification system for mental health and mental-health care, subjective levels of emotional distress are critical to the diagnostic process, and to determining what is “disordered” versus what is “normal.”

There is tremendous variation in subjective emotional experience, including how aware individuals are of their emotions and how well they are able to regulate them (Aldao, Nolen-Hoeksema, & Schweizer, 2010; Werner & Gross, 2010). For example, somebody who considers themselves “emotional” (i.e., easily feels sad, anxious, angry, lonely, or isolated) could be normal, dysthymic, or neurotic according to conventional clinical standards, depending on how pervasive, intense, long-lasting, impairing, and distressing the negative emotions are reported to be. In addition, negative emotions do not typically occur in isolation. For example, epidemiological surveys have found that over 50% of patients diagnosed with depression also have an anxiety disorder (Kessler, Chiu, Demler, & Walters, 2005). According to the DSM-V (American Psychiatric Association, 2013), comorbidity occurs regularly between mood, anxiety, substance use, pain, and sleep disorders. Moreover, because emotional distress has psychophysiological and biochemical consequences, stress-related physical symptoms frequently cooccur with chronic negative affect (Watson & Pennebaker, 1989). The high prevalence of comorbidity between emotional disorders suggests that negative affectivity is widely shared within, among, and across current diagnostic categories. Indeed, brain-imaging studies have begun to uncover shared functional correlates across mental disorders like depression and substance use, such as heightened amygdala reactivity to emotional stress and relatively weak frontal inhibition of emotional reactivity (Chiesa, Brambilla, & Serretti, 2010). Dysregulated frontal-limbic circuitry is now an accepted biomarker of emotion dysregulation and thus represents a functional target for transdiagnostic treatment approaches, including mindfulness training (Brewer, Bowen, Smith, Marlatt, & Potenza, 2010; Chiesa et al., 2010; Garland et al., 2011; Ochsner, Silvers, & Buhle, 2012).

The triple vulnerabilities theory postulates that a common set of biological, psychological, and context-specific vulnerabilities interact to develop and maintain a host of

emotional disorders, including anxiety, depression, posttraumatic stress, substance use, eating, somatoform (pain), and sleep disorders (Barlow et al., 2011). At the core of the triple vulnerabilities theory is the assumption that a predisposition—a psychobiological diathesis—lies dormant until activated by stress, which is always specific to one's current life context. Hence, the triple vulnerabilities theory is one way to explain how different diagnostic categories can share common dysfunctional *processes*, but the *content* of dysfunction differs from person to person. Clinically, individual differences in emotional experience, due to possible differences in cognitive, affective, neural, psychophysiological, behavioral, and/or genetic factors, make it difficult to reliably predict mental-health outcomes following conventional diagnosis and treatment (Insel et al., 2010). Therefore, identifying a viable approach to target negative affectivity and its associated biological, psychological, and contextual vulnerability factors would be clinically useful, widely applicable, and efficient.

Numerous systematic reviews and meta-analyses have documented consistent effects of mindfulness-based interventions on reducing negative affectivity. Specifically, reduced negative affect has been observed across clinical disorders, including depression and anxiety (Fjorback, Arendt, Ørnbøl, Fink, & Walach, 2011; Hofmann et al., 2010; Vøllestad et al., 2012), substance use (Bowen et al., 2009; Witkiewitz & Bowen, 2010), and chronic pain conditions (Chiesa & Serretti, 2011; Rosenzweig et al., 2010), as well as among samples of healthy but stressed adults (Bohlmeijer et al., 2010; de Vibe et al., 2012). Increases in self-report measures of mindfulness partly mediated reduced negative affect and improved mental health in several trials (Carmody & Baer, 2008; Garland, Gaylord, & Fredrickson, 2011; Greeson, Webber, et al., 2011; Shapiro, Brown, & Biegel, 2007), suggesting that mindful processes such as observing, describing, nonjudging, nonreacting, and acting with awareness are directly related to change in a core transdiagnostic vulnerability factor.

Mindfulness training may also reduce the tendency to experience negative emotions by enhancing emotion regulation (Chambers et al., 2009; Chiesa et al., 2013; Keng et al., 2011). For example, Mindfulness-Based Cognitive Therapy (MBCT) has been found to increase both attentional capacity and metacognitive awareness, which, in turn, were associated with reduced avoidance of distressing thoughts and feelings, increased ability to tolerate negative emotions, and decreased reliance on rumination—a maladaptive emotion-regulation strategy (Corcoran, Farb, Anderson, & Segal, 2010). Following an 8-week Mindfulness-Based Stress Reduction (MBSR) program, changes in two emotion-regulation strategies—decreased suppression and increased reappraisal—correlated with both increased mindfulness of thoughts and feelings, and decreased symptoms of anxiety and depression (Greeson, Smoski, Brantley, Suarez, & Wolever, 2011). These findings are consistent with the hypothesis that mindfulness training may target negative affectivity, in part, by enhancing cognitive regulation of negative emotions (Baer, 2003; Chiesa et al., 2013; Shapiro et al., 2006).

Chambers and colleagues (2009) have proposed an alternative model of “mindful emotion regulation” in which conscious efforts to control or regulate emotions, through cognitive reappraisal, for example, may be antithetical to traditional Eastern conceptualizations of mindfulness and meditation, in which the goal is simply to observe one's experience as it unfolds moment by moment, without interfering or trying to alter it. In an effort to integrate the observing, accepting attitude embodied in

traditional mindfulness meditation practice with the well-documented psychological benefits of cognitive reappraisal that stem from cognitive-behavioral therapy, Garland and colleagues (2009) proposed a mindful coping model in which stress appraisals (i.e., initial thoughts, judgments, expectations, beliefs, and perceived limitations) can be transformed into positive opportunities for growth, flexibility, and healthy change by meditating on one's distressing experience in the moment, and using metacognitive awareness derived from a "decentered" perspective to let go of concepts, attachments, and self-limitations in order to actively see new possibilities from a larger, nonself-focused context. That conceptualization of mindful coping suggests an instrumental role of Langer's concept of mindful learning in the process of attaining greater mental health through meditation practice.

Another way in which mindfulness can specifically target, or ameliorate, negative affect is by modulating emotional reactivity. Reacting intensely, automatically, and habitually to the experience of negative emotions and stress is itself implicated in various forms of psychopathology, from major depressive disorder and borderline personality disorder to posttraumatic stress disorder (PTSD), and substance abuse and dependence (Kring & Sloan, 2010). Hence, emotion dysregulation in the context of emotional disorders has much to do with the problem of reactivity. Unfortunately, because intense emotional experiences are aversive, people often try to cope by attempting to suppress them (Gross & John, 2003; Salters-Pedneault, Steenkamp, & Litz, 2010; see also section "Suppression" in this chapter). Paradoxically, however, the more one tries to suppress negative emotions, the more distress they experience and the greater the psychophysiological activation, not less (Gross, 2002). Moreover, because the momentary experience of negative affect can be amplified and prolonged by a number of cognitive biases in attention, interpretation, memory, and self-focus, states of emotional distress can interact with traits of emotional distress to increase the risk, severity, and relapse of emotional disorders (Harvey et al., 2004; Ingram, Atchley, & Segal, 2011; Mathews & MacLeod, 2005).

Experimental investigations of mindfulness in the laboratory are beginning to elucidate how various types of mindful practices can mitigate emotional reactions, and thereby buffer vulnerability to mental disorder. MBCT for recurrent major depression, for example, has been shown to reduce overgeneral memory, which is associated with a depressogenic downward spiral involving an interaction between negatively biased information processing and amplified negative affect, resulting in longer-term depressed mood (Williams, Teasdale, Segal, & Soulsby, 2000). Mindful breathing meditation—one of the core techniques taught in MBSR, MBCT, and other mindfulness-based interventions—has been shown to mitigate cognitive reactivity to negative (sad) mood induction (Arch & Craske, 2006), and to uncouple negative emotional reactions from repetitive thoughts (Feldman, Greeson, & Senville, 2010). In an ongoing open trial of MBSR for healthy but stressed adults who have trouble sleeping, we have observed decreased emotional reactivity during an anger-recall task, in which participants recount "an event from your life that made you angry, and when you think about it today *still* makes you angry" (Greeson et al., 2013). Decreased emotional reactivity to personally salient social stress induced in the lab has also been observed following MBCT (Britton, Shahar, Szepsenwol, & Jacobs, 2012). Finally, a cross-sectional survey study found that higher levels of dispositional mindfulness

weakened the association between neuroticism and trait anger and depressive symptoms (Feltman, Robinson, & Ode, 2009), consistent with the theory that mindfulness can mitigate the tendency to react to stress with negative emotions.

Taken together, convergent results from clinical intervention trials and experimental laboratory studies support the hypothesis that mindfulness practice can reduce negative affectivity. Lower levels of negative affect are accounted for, in part, by higher levels of trait mindfulness, and by diminished reactivity to emotional distress in the moment. These findings are consistent with both Eastern and Western theories of the psychological processes by which mindfulness benefits mental health (Walsh & Shapiro, 2006). Ongoing programs of research are translating available results into novel, theory-driven mindfulness-oriented programs designed specifically to target the cognitive, affective, psychophysiological, neural, and behavioral processes implicated in challenging conditions such as alcohol dependence, chronic pain with opiate dependence, and stress-related sleep disturbance (Bowen, Chawla, Marlatt, & Parks, 2010; Garland, 2013; Greeson, 2008; Harvey, 2009)

Repetitive negative thought

Negative thinking in the form of worry, rumination, obsession, catastrophizing, and self-judgment is like an engine that produces negative affect. Negative thinking that is repetitive and unconstructive can induce or exacerbate negative moods, such that transient feelings of sadness can spiral into depression, momentary feelings of fear can feed longer lasting anxiety, and impulsive cravings can develop into addiction (Watkins, 2008). As described elsewhere in this chapter (see section “Attentional bias”), negative thinking is marked by a number of cognitive biases in attention, interpretation, and memory (Mathews & MacLeod, 2005). Briefly, when one tends to attend selectively to negative aspects of a situation, the negativity becomes amplified in awareness. Over time, this repeated mental process can contribute to the onset, maintenance, or relapse of psychological disorders like depression, anxiety, substance use, and insomnia (Harvey, 2008; Mansell et al., 2008). Because repetitive negative thinking is largely dispositional, individuals often report that their automatic thoughts, negative judgments, pessimistic beliefs, and catastrophic, overgeneralized expectations seem automatic and difficult to control. The subjective perception of automaticity is consistent with experimental findings that demonstrate negative thinking and negatively biased attention, interpretation, and memory retrieval are all implicit cognitive processes (Friedman & Whisman, 2004; Teachman & Woody, 2004). Paradoxically, the more one tries to suppress intrusive negative thoughts, and corresponding negative affect, the more helpless, distressed, and out of control one can feel (Salters-Pedneault et al., 2010). Therefore, vulnerability to multiple forms of psychopathology involves a dynamic interaction between negative thinking, negative affect, biased information processing, and unsuccessful attempts to mentally control upsetting thoughts and feelings (Ingram et al., 2011; Mathews & MacLeod, 2005). Whereas cognitive and cognitive-behavioral therapies aim to teach patients a variety of emotion-regulation skills, such as cognitive reappraisal, thought stopping, exposure, and distraction, mindfulness meditation training could conceivably offer a transtherapeutic approach

to coping with repetitive negative thoughts and associated negative affect not by controlling, restructuring, stopping, or otherwise controlling upsetting thoughts or emotions, but rather by fundamentally changing how one relates to so-called mental events that arise in one's consciousness in a given moment (Baer, 2007; Chambers et al., 2009; Greeson & Brantley, 2008; Sauer & Baer, 2010; Shapiro et al., 2006; Teasdale, 1999).

Mindfulness can help individuals change how they relate to thoughts and feelings through several interrelated cognitive, emotional, psychophysiological, and behavioral processes. From a cognitive standpoint, mindfulness meditation practice cultivates a fundamental shift in perspective variably called decentering, re-perceiving, or metacognitive awareness (Fresco et al., 2007; Safran & Segal, 1996; Shapiro et al., 2006). This shift in view is characterized by not identifying as strongly with the contents of one's thoughts and feelings, primarily by viewing thoughts, feelings, judgments, expectations, and other perceptions as transient mental events in the field of one's awareness. By simply observing thoughts, emotions, and other perceptions with a sense of openness, curiosity, nonjudgment, and acceptance, one is able to grow increasingly comfortable exposing oneself to potentially upsetting thoughts, feelings, and even physical pain or discomfort without trying to change, diminish, or otherwise control one's experience. Cultivating this ability to "decenter" or "re-perceive" one's experience of stressful, anxiety-producing, depressing, or otherwise unpleasant, repetitive thoughts can help prevent such thoughts from causing or exacerbating negative affect (Teasdale, 1999). When individuals, whether generally healthy but stressed or those with psychological disorders, are able to observe upsetting thoughts or feelings without reacting automatically, they typically report feeling more in control, less distressed, and better able to cope (Allen, Bromley, Kuyken, & Sonnenberg, 2009; Dobkin, 2008; Fonteyn & Bauer-Wu, 2005; Kerr, Josyula, & Littenberg, 2011). From a psychophysiology and neuroscience standpoint, reappraisal or developing a "wise relationship" with one's thoughts and feelings is marked by greater cognitive, prefrontal control of emotional reactivity in the limbic system (Farb, Anderson, & Segal, 2012; Goldin & Gross, 2010; Greeson & Brantley, 2008; Ochsner et al., 2012), less narrative self-focused processing in the default mode network (DMN; Brewer et al., 2011; Farb et al., 2007; Hasenkamp & Barsalou, 2012), and less exaggerated physiological responses to emotional stress (Greeson et al., 2013; Nyklicek, Mommersteeg, Van Beugen, Ramakers, & Van Boxtel, 2013). In addition, recent neuroimaging studies have indicated that mindfulness meditation practice—a largely sensory process—is associated with increased functional connectivity within and among attentional networks, sensory cortices, and limbic structures (Farb et al., 2012; Froeliger et al., 2012; Hasenkamp & Barsalou, 2012; Hölzel et al., 2013; Kilpatrick et al., 2011). Taken together, research in the emerging field of mindfulness neuroscience supports the notion of neuroplasticity, that brain structure, function, and connectivity are changeable with meditation (Tang & Posner, 2013).

Several clinical trials and experimental laboratory studies have found evidence that mindfulness meditation training can reduce rumination—a transdiagnostic mental process marked by repetitive thoughts about one's negative mood and one's life problems (Nolen-Hoeksema et al., 2008). These studies showed that reduced rumination was associated with reduced depressive symptoms (Burg & Michalak, 2011;

Deyo, Wilson, Ong, & Koopman, 2009; Heeren & Philippot, 2011; Van Vugt, Hitchcock, Shahar, & Britton, 2012) and decreased sleep disturbance (Greeson, 2011). Another study found that a single session of mindful breathing meditation, compared to loving-kindness meditation or progressive muscle relaxation, was associated with greater decentering scores as well as less negative emotional reactivity to repetitive thoughts experienced during the guided meditation exercise (Feldman et al., 2010). Therefore, convergent evidence from clinical intervention trials and experimental laboratory studies has shown that mindfulness meditation practice offers a systematic method for cultivating a core shift in perspective characterized by less focus on oneself, less need for conscious cognitive control, less emotional reactivity to repetitive negative thoughts, diminished limbic and physiological reactivity to acute emotional stress, and increased sensory processing in the brain. These cognitive, emotional, neural, and physiological processes, alone or in combination, help mitigate the pathological effects of self-focused, negative, repetitive thinking and associated arousal of negative affect. Empirical findings reviewed here support the theory of mindful emotion regulation, in which a shift in view away from cognitive control and toward unbiased observation, acceptance, and allowance is associated with greater emotional balance, more efficient brain function, and physiological homeostasis, with potential long-term implications for better mind-body health (Chambers et al., 2009).

Experiential avoidance

Attempting to mask, suppress, distract oneself from, or otherwise avoid, unpleasant psychological experiences has been termed experiential avoidance (Hayes, Wilson, Gifford, Follette, & Strosahl, 1996). According to Hayes, Strosahl, and Wilson (2012), experiential avoidance is believed to cause, exacerbate, or maintain numerous psychological disorders, including depression, various forms of anxiety, PTSD, eating disorders, substance abuse, and chronic pain. One mindfulness-oriented behavioral therapy, called Acceptance and Commitment Therapy (ACT), specifically aims to decrease experiential avoidance by having patients deliberately expose themselves to distressing thoughts, emotions, and beliefs they ordinarily avoid. To target experiential avoidance, ACT couples deliberate exposure to distressing thoughts and feelings with a technique called cognitive defusion. Consistent with the core principles and practices of Buddhism, cognitive defusion teaches patients to let go of attachments to the literality of language, including negative thoughts, judgments, and beliefs, and to see “self-as-context” (Hayes, 2003; Hayes & Shenk, 2004). Building on a fundamental shift in perspective engendered by exposure, acceptance, and cognitive defusion, ACT encourages patients to then engage in values-based action. Values-based action occurs when individuals commit to acting in accord with their most important values, rather than acting in ways that serve to avoid distress in the moment, but maintain distress or disorder long-term (Hayes et al., 2012). For example, in ACT, a patient who repeatedly and uncontrollably worries about multiple areas in their life, such as health, finances, and relationships, could be encouraged to visualize worries passing like clouds through the sky. Viewing thoughts, judgments, and emotions as passing

mental events, rather than identifying with them or even seeing mental events as accurate representations of reality, affords a greater sense of distance, a sense that one is more than one's thoughts and feelings (Fresco et al., 2007). The ability to analyze inner experiences with greater self-distance, without avoiding or ruminating or otherwise reacting mindlessly, is believed to increase adaptive self-focus and insight, which, in turn, can guide wise action, leading to better mental and physical health (Ayduk & Kross, 2010; Baer, 2009; Shapiro et al., 2006; Teasdale, 1999).

There are significant mental- and physical-health implications of learning to let go of experiential avoidance. When upsetting thoughts, emotions, and physical sensations are experienced as transient and constantly changing, without having to avoid or suppress them, patients are often able to disengage from automatic, maladaptive, mindless behaviors, such as overeating, using illicit substances, or using maladaptive cognitive strategies like worry or rumination to try and control unpleasant emotions (Hayes et al., 2012). The phenomenology of defusion in ACT is akin to decentering or re-perceiving in mindfulness meditation. From the perspective of ACT, as one develops greater skill defusing from attachments to thoughts, ideas, beliefs, or expectations, one is able to gain psychological flexibility and behavioral freedom, with mental-health benefits comparable to conventional CBT (Powers, Zum Vörde Sive Vörding, & Emmelkamp, 2009). In contrast to other mindfulness-based interventions like MBSR, MBCT, and Mindfulness-Based Relapse Prevention (MBRP), however, ACT does not provide instruction in meditation per se, nor does it expect one to develop and maintain a daily meditation practice to build the core skills of exposure, acceptance, defusion, and values-based action—all of which could also come through mindfulness meditation (Baer, 2003; Shapiro et al., 2006).

A primary mechanism of change in ACT is increased psychological flexibility, defined as "... the process of contacting the present moment fully as a conscious human being and persisting in or changing behavior in the service of chosen values" (Gloster, Klotsche, Chaker, Hummel, & Hoyer, 2011). This definition is similar to both Eastern and Western conceptualizations of mindfulness insofar as each focuses on the core process of detaching oneself from rigid, self-limiting ways of seeing and ways of being that can harm mental and physical health. Hence, like MBSR and other meditation-based versions of mindfulness training, ACT aspires to cultivate a fundamental shift in perspective designed to increase awareness of attachment to rigid, automatic, distress-producing ideas, thoughts, beliefs, and expectations, with the aim of detaching from them. When one's inner experience can be perceived differently—more objectively, without reacting automatically—one has the opportunity to reappraise one's situation and then choose how to act in a way healthy, mindful, flexible way, especially in the face of stress, adversity or illness (see section "Reappraisal"; for a conceptual review, see Garland, Gaylord, & Park, 2009).

In several observational and randomized controlled trials, therapeutic outcomes of ACT have been partly mediated by reduced experiential avoidance, or increased psychological flexibility (Hayes, Levin, Plumb-Villardaga, Villatte, & Pistorello, 2013). An open trial of MBSR also found significantly reduced levels of experiential avoidance, which were significantly correlated with reduced rumination, thought suppression, and symptoms of anxiety and depression on one hand, and increased mindfulness of thoughts and feelings on the other (Greeson et al., 2010). Qualitative studies have further reported that individuals trained in mindfulness meditation are able to develop

an observing attitude, in which they learn to witness their inner experience more objectively, less judgmentally, and nonreactively, which is associated with both improved psychological well-being and healthy lifestyle behaviors in the face of stress, mental disorder, or medical illness (Allen et al., 2009; Dobkin, 2008; Kerr et al., 2011; Kerrigan et al., 2011; Mackenzie, Carlson, Munoz, & Specca, 2007; Morone, Lynch, Greco, Tindle, & Weiner, 2008).

Taken together, mindfulness-oriented techniques, whether they involve meditation practice or not, combine exposure, acceptance, values, and behavior change strategies to help individuals experience distress without having to avoid it, which in turn affords new possibilities for seeing oneself, and one's possibilities, differently—a mark of psychological resilience to mental and physical disorders.

Attentional bias

Attention enhances information processing of emotionally salient objects or events (Desimone & Duncan, 1995) by selecting them from the environmental context in which they are embedded (Corbetta & Shulman, 2002). Thus, attention gates perceptions of stimuli for the subsequent evaluation of their motivational relevance. Depending on their significance to the survival of the organism, objects of attention elicit the motivation to approach or avoid, while the resultant emotional state, as the manifestation of approach or avoidance motivations, tunes and directs attention (Friedman & Förster, 2010; Lang & Bradley, 2010). As such, attention is often biased towards emotionally significant stimuli, such that individuals detect and sustain attention on mood-congruent objects and events more rapidly than those who are not congruent with their current emotional state (Mathews & MacLeod, 2005). Thus, individuals suffering from chronic, negative emotional states tend to pay attention to disappointing, upsetting, or frightening experiences, while overlooking or ignoring features of the environmental context that are beautiful, affirming, or pleasurable.

Attentional bias has been observed among persons diagnosed with mood disorders, anxiety disorders, eating disorders, chronic pain, and even addiction, among other conditions. Persons experiencing high levels of anxiety, for example, tend initially to orient their attention to threatening stimuli which they then try to deliberately avoid (Cisler & Koster, 2010; MacLeod, Mathews, & Tata, 1986). However, many anxious individuals find it difficult to disengage their attention from threatening objects and events (Fox, Russo, & Dutton, 2002). Similarly, persons with substance-use disorders tend to exhibit addiction attentional bias, whereby attention may be automatically captivated by and fixated on substance-related cues like a liquor bottle or crack pipe (Field & Cox, 2008). Addiction attentional bias may be exacerbated by stress (Field & Quigley, 2009), is associated with craving (Field, Munafò, & Franken, 2009), and can increase the consumption of substances (Field & Eastwood, 2005). Attentional bias towards affectively salient stimuli is subserved by increased activation in brain regions that subserve emotional information processing, such as the amygdala and insula (Costafreda, Brammer, David, & Fu, 2008; Frewen, Dozois, Joannis, & Neufeld, 2008). By promoting hypervigilance to emotionally significant objects or events, attentional biases may create an obsessive focus that amplifies and perpetuates dysphoria, fear, and self-destructive habits.

Mindfulness training may modify attentional biases by strengthening attentional disengagement from triggers and facilitating attentional reorienting to neutral or health-promoting stimuli. During mindfulness training, participants are taught to recognize when their attention has been captivated by distressing mental content or aversive perceptual experience, and then to shift their focus back to the sensation of respiration as a means of “stepping back” or decentering from emotional reactions (Carmody, 2009). Each time attention wanders to maladaptive thoughts or feelings, the client is taught to accept that this has happened, and then to disengage and return the focus of attention back to the breath. As a result of this practice, mindfulness training improves the general capacity to disengage and shift attention efficiently from one object to another (Jha, Krompinger, & Baime, 2007).

Strengthening domain-general attentional control through mindfulness training may have positive effects on attentional bias in clinical populations. For instance, among persons struggling with alcohol dependence, participation in Mindfulness-Oriented Recovery Enhancement was associated with significant changes in alcohol attentional bias (Garland, Gaylord, Boettiger, & Howard, 2010), and recovering alcoholics who are higher in trait mindfulness are better able to disengage their attention from addictive cues (Garland, Boettiger, Gaylord, Chanon, & Howard, 2012), which predicts the extent to which they can recover physiologically from exposure to such cues (Garland, 2011). Mindfulness training may also reduce attentional biases among individuals suffering from chronic pain syndromes. Compared to meditation-naïve fibromyalgia patients, patients in a mindfulness training program exhibited significantly greater attentional disengagement from pain-related visual cues (Vago & Nakamura, 2011). Similarly, chronic pain patients randomly assigned to eight weeks of Mindfulness-Oriented Recovery Enhancement evidenced significantly greater decreases in pain attentional bias than those assigned to a support-group control condition (Garland & Howard, 2013). Lastly, evidence suggests that MBCT, compared to a comparison group, can reduce attentional bias toward negative information processing among persons with a history of depression (De Raedt et al., 2012).

The practice of mindfully becoming aware of and disengaging attention from distressing objects, events, and experiences may allow for flexible deployment of attention to adapt to situational demands and allow for a fuller appreciation and enjoyment of life.

Reappraisal

Because many situations in life involve a high degree of ambiguity, the meaning of human encounters is often complex, subtle, and indeterminate. Adaptation to ambiguous situations with uncertain outcomes may result in stress and the sense of a loss of control (Monat, Averill, & Lazarus, 1972). When confronted with the same stressor (e.g., being fired from a job), one individual may respond with depression and apathy, another with anger and aggression, and a third with optimism and constructive action. In each case, the stressor event is the same, but the appraisal of that event results in distinct emotional, behavioral, and physiological consequences. Individuals appraise stressors for their risk value or significance to the self, while assessing whether

available resources and coping options are sufficient to meet the demands of the stressor (Lazarus & Folkman, 1984). The appraisal process may be executed rapidly, in 50 milliseconds for certain, evolutionarily salient classes of stimuli, such as snakes (Öhman, Carlsson, Lundqvist, & Ingvar, 2007), and automatically without conscious deliberation (Bargh & Chartrand, 1999). Such automatic appraisals are conditioned both by past experience and by present emotional state. Alternatively, conscious appraisals are slower and more methodical, unfolding over minutes (or even longer) as an individual uses reason and logic to interpret the meaning of a stressor event.

If, through the process of appraisal, available resources are deemed to be insufficient to manage or resolve the stressor, this computation will initiate the biopsychosocial sequelae of the stress reaction. The stress reaction involves the activation of neural circuits linking the extended amygdala to the hypothalamic–pituitary–adrenal axis, the locus coeruleus, and the autonomic nervous system. Activation of this stress pathway results in secretion of beta-endorphin and adrenocorticotropin, which in turn lead to the release of cortisol from the adrenal cortex (Brosschot, Gerin, & Thayer, 2006). Cortisol etches the significance of the stressor deeply within the brain by sensitizing neurotransmission between the amygdala and hippocampus, thereby enhancing information processing of threat-related stimuli and strengthening encoding of fear memories (McEwen, 2007). Concurrently, stress appraisal initiates a rapid “fight-or-flight response” (Cannon, 1929) governed by the central autonomic network (Thayer & Lane, 2009), a system of neural circuits linking the cortex and limbic regions to the viscera and periphery via the sympathetic and parasympathetic nervous systems. During the fight-or-flight response, the central autonomic network prepares the individual to flee or defend against a threatening event by innervating muscle groups, driving the pacemaker of the heart, slowing digestion, stimulating sweat gland activity, and regulating shifts in body temperature (Janig, 2002). These physiologic changes are often coupled with dysphoric emotions of anxiety, rage, and sorrow that further bias appraisal processes toward negative information processing.

Yet, appraisal processes are not static—reappraisal occurs when the initial stress appraisal is modified by an influx of new information or through the reorganization of associations linked with the stressor and its context. During the process of reappraisal, the meaning of a stressful or adverse event is reconstrued so as to reduce its negative emotional impact (Folkman & Moskowitz, 2000; Lazarus & Folkman, 1984). Reappraisal attenuates stress physiology (Gross, 2002), increases top-down prefrontal control over limbic reactivity (Ochsner & Gross, 2005), and is often a crucial step toward reengaging with the stressor event. Mindfulness training may facilitate reappraisal processes (Garland et al., 2009, 2011). In the wake of an adverse event, mindfulness practice allows one to disengage from the initial negative appraisal into the metacognitive state of mindfulness. From the broadened perspective afforded by the state of mindfulness, the scope of attention is enlarged to encompass previously unattended contextual information from which new appraisals of the stressful event may be generated. By accessing this expanded set of information, individuals can then reappraise their circumstances in a way that attenuates the stress reaction and promotes prosocial and constructive action. Speculatively, this “mindful reappraisal” process may unfold temporally such that mindfulness practice first attenuates activation in brain areas that instantiate self-referential, linguistic processing during negative

emotional perturbations (i.e., medial prefrontal cortex; see Farb et al., 2010), which then facilitates the set shifting process of cognitive reappraisal as emotional interference is attenuated while alternate construals of the stressor are evaluated for their significance to the self (Kalisch, 2009).

A growing body of research suggests that mindfulness may promote reappraisal. A prospective observational study of 339 adult participants in an 8-week-long mindfulness-based stress and pain-management program indicated that the stress-reductive effects of increases in dispositional mindfulness were partially mediated by increases in positive reappraisal (Garland et al., 2011). Another large prospective observational study of 322 adults found that increased mindfulness of thoughts of feelings after an 8-week MBSR program was directly related to both increased emotion reappraisal and decreased emotion suppression, which in turn were related to reduced symptoms of anxiety and depression (Greeson, Smoski, et al., 2011). A laboratory study employing electroencephalography found that when compared to controls, meditators evidenced greater reappraisal efficacy as evidenced by significantly larger attenuation of brain activity in centro-parietal regions during reappraisal of aversive images (Gootjes, Franken, & Van Strien, 2011). Trait mindfulness has also been linked with reappraisal in neuroimaging research; trait mindfulness was significantly associated with dorsomedial prefrontal cortex activation during a reappraisal task, which in turn was inversely correlated with amygdala reactivity to negative stimuli (Modinos, Ormel, & Aleman, 2010). Lastly, a recent study found that individuals who had completed a course of Mindfulness-Based Cognitive Therapy evidenced significantly greater reappraisal efficacy during negative mood induction than those who had been treated with cognitive-behavior therapy or a matched control group (Troy, Shallcross, Davis, & Mauss, 2012).

Thus, the cognitive flexibility engendered by mindfulness training may promote emotion regulation by facilitating reappraisal of stressful or adverse circumstances. In undoing habitual or automated ways of viewing and construing difficult circumstances, mindfulness may allow for more nuanced appreciation of challenging life contexts and the opportunities embedded within them.

Suppression

When confronted with unwanted or intrusive thoughts or feelings, many individuals attempt to cope through suppression. The effort to not think about something can, however, ironically enhance the accessibility of the unwanted thought to consciousness. This so-called “rebound effect” is suggested by studies demonstrating that attempted suppression often results in an increased rate of the thoughts and emotions it is directed against (Wegner, Schneider, Carter, & White, 1987; Wenzlaff & Wegner, 2000). Suppression is thought to involve two processes: a conscious search for thoughts and feelings consistent with the desired mental state, and an unconscious monitoring process that searches continually for thoughts and feelings that are inconsistent with the desired state (Wegner, 1994). Inadvertently, by searching the mind for undesirable mental contents to be replaced, this actually leads to increased accessibility of the unwanted thoughts, especially under conditions of high stress

(Wegner & Erber, 1992). When suppression is sustained over time, it depletes the resources needed for self-control, resulting in a rebound of unwanted thoughts and feelings (Muraven & Baumeister, 2000). These deleterious effects may be exacerbated when persons whose neurocognitive control resources have already been depleted due to chronic thought suppression engage in acute suppression of intrusive thoughts (Garland, Carter, Ropes, & Howard, 2012).

Suppression is a common coping response, yet its effects may be especially pernicious among psychologically vulnerable individuals. Indeed, suppression exacerbates posttraumatic stress, addiction, and obsessive-compulsive tendencies, among other pathological states and behaviors (Wenzlaff & Wegner, 2000). For instance, when instructed to suppress urges following alcohol cue exposure, alcoholics exhibited faster reaction times to alcohol-related statements than to neutral phrases (Palfai, Monti, Colby, & Rohsenow, 1997). Similarly, abstinent alcohol dependent individuals experienced greater Stroop interference for the word “alcohol” after they had initially attempted to suppress alcohol-related thoughts compared to individuals who expressed thoughts of drinking (Klein, 2007). Rebound effects following suppression have also been identified for appetitive behavior: suppression of thoughts of smoking (Erskine, Georgiou, & Kvavilashvili, 2010) and eating (Erskine & Georgiou, 2010) has been shown to result in greater enactment of such behaviors in the lab and in everyday life. Moreover, suppression is commonly used to cope with intrusive thoughts, feelings, and memories resulting from traumatic experiences. Ironically, suppression may exacerbate the intrusive trauma-related cognitions that are the hallmark of PTSD (Tull, Gratz, Salters, & Roemer, 2004) by impeding the processing and subsequent integration of traumatic memories into long-term memory (Elzinga & Bremner, 2002; Foa & Kozak, 1986). In that regard, after survivors of a motor-vehicle accident engaged in a period of thought suppression, they experienced twice as many thoughts about the accident than they did prior to suppression (Beck, Gudmundsdottir, Palyo, Miller, & Grant, 2006). Coping through suppression has been shown to predict the occurrence of PTSD up to three years after a motor-vehicle accident (Ehlers, Mayou, & Bryant, 1998; Mayou, Ehlers, & Bryant, 2002). Suppression may also underlie the comorbidity between these conditions; for example, an observational study of patients with comorbid substance dependence, psychiatric disorders, and extensive trauma histories found that thought suppression is associated with higher levels of posttraumatic stress symptoms and drug craving (Garland & Roberts-Lewis, 2013).

Insofar as participants in mindfulness-based interventions are taught to accept their mental experiences rather than push them away or cling to them, mindfulness training may prevent the maladaptive consequences of suppression. Thus, mindfulness training may obviate the need to suppress unwanted thoughts, emotions, and urges by enhancing acceptance and fostering a nonjudgmental attitude toward these experiences. This practice has been conceptualized as a form of mindful exposure (Hölzel et al., 2011) which facilitates experiencing unpleasant events without avoidance or emotional reactivity, leading to extinction of conditioned responses and desensitization to experiences that were previously felt to be distressing.

Empirical research indicates that mindfulness training may decrease suppression. Indeed, the salutary effects of mindfulness training on alcohol use and drinking

consequences are mediated by decreased suppression (Bowen, Witkiewitz, Dillworth, & Marlatt, 2007). Mindfulness-Oriented Recovery Enhancement has been shown also to lead to significant reductions in thought suppression that were associated with decreases in alcohol attentional bias and increases in heart-rate variability recovery from stress and alcohol cue exposure (Garland et al., 2010). Furthermore, in observational research, the effect of MBSR on rumination has been shown to be partially mediated by decreases in thought suppression (Greeson et al., 2009). Lastly, in an experiment in which participants were asked to suppress their emotions, those who engaged in mindfulness meditation following suppression performed equally as well as those who had not depleted their self-control resources previously, indicating that mindfulness meditation may restore the depleting effects of suppression (Frieze, Messner, & Schaffner, 2012).

Thus, mindfulness may reduce the tendency to suppress aversive thoughts and feelings, thereby increasing awareness of distressing mental content that might otherwise drive mindless, automated, and self-destructive responses. By allowing thoughts and feelings that had been previously suppressed to surface to consciousness, habitual or schematized ways of thinking and behaving that may have been operating unchecked by controlled cognitive processing during active suppression may become accessible to explicit cognitive control.

Summary

The transdiagnostic mental processes reviewed above are all characterized by *mindlessness*, as evidenced by entrapment in old categories; by automatic behavior that precludes attending to new signals; and by action that operates from a single perspective (Langer, 1997). In this way, mindlessness is akin to being on automatic pilot (Kabat-Zinn, 1990; Langer, 1997). Conversely, mindfulness practice can broaden one's perspective to realize myriad psychological- and physical-health benefits. In the next section, we describe how the process of mindful learning provides a unified framework for understanding how mindfulness meditation training functions as a transtherapeutic process.

Mindful Learning: A Lens for Seeing Mindfulness Meditation as Transtherapeutic

In the perspective of every person lies a lens through which we may better understand ourselves. (Langer, 2005)

Mindfulness, at its essence, involves a fundamental shift in perspective—a shift toward present-focused attention, open awareness, and an understanding of context and conditionality. This shift in perspective is illustrated by the distinction between the transdiagnostic qualities of *mindlessness*, which pervade mental disorders, and the transtherapeutic qualities of mindfulness, which afford resilience, control, and self-regulation (see Table 28.1). As articulated by other authors (Lutz, Slagter, Dunne, & Davidson,

Table 28.1 Transdiagnostic mental processes and transtherapeutic mindful processes.

<i>Transdiagnostic mental processes</i>	<i>Transtherapeutic mindful processes</i>
Attentional bias <ul style="list-style-type: none"> • Selective attention, negative bias 	Open monitoring <ul style="list-style-type: none"> • Nonjudgment, broadened awareness (esp. sensory awareness)
Negative thinking <ul style="list-style-type: none"> • Repetitive negative thought: worry, rumination, catastrophizing, obsession, etc. 	Decentering <ul style="list-style-type: none"> • Nonreactive observation of thoughts, feelings, and perceptions
Inflexible appraisal <ul style="list-style-type: none"> • Rigid, automatic, rule-bound information processing, judgments, and stereotypic decision-making 	Flexible reappraisal <ul style="list-style-type: none"> • Realize automatic thoughts, fixed assumptions, and habitual behavior; reappraise to see and act differently
Self-focused attention <ul style="list-style-type: none"> • Self-absorption • Self-concept • Self-schema 	Mindful self-focused attention <ul style="list-style-type: none"> • Metacognitive awareness • Self-in-context • Sensory focus (not narrative focus)
Memory bias <ul style="list-style-type: none"> • Overgeneral (autobiographical) memory 	Clear seeing <ul style="list-style-type: none"> • Accurate, nonbias, not deluded
Negative affectivity/Emotional reactivity <ul style="list-style-type: none"> • Neuroticism; propensity to experience distress (anxiety, depression, anger, loneliness, etc.) 	Emotional Balance <ul style="list-style-type: none"> • Positive emotions, wholesome states, nonreactivity, equanimity
Suppression <ul style="list-style-type: none"> • Thought suppression (of unwanted intrusive thoughts) • Emotion suppression (of feelings and outward expression) 	Mindful exposure <ul style="list-style-type: none"> • Observe, describe, nonjudge, accept, allow, let be
Avoidance <ul style="list-style-type: none"> • Of inner experience; distress intolerance 	Mindful exposure <ul style="list-style-type: none"> • Observe, describe, nonjudge, accept, allow, let be
Behavioral dysregulation <ul style="list-style-type: none"> • Habitual reactivity, characterized by rigid, narrow, stereotypical cognitive-behavioral response pattern to emotional distress • E.g., substance use, overeating, sedentary behavior, sleep disturbance 	Skillful self-regulation <ul style="list-style-type: none"> • Nonreactivity; act with awareness • Flexible behavioral self-regulation

2008; McCown, Reibel, & Micozzi, 2010), mindfulness meditation practices, in their different forms, are all intended to cultivate the transtherapeutic qualities of mindfulness, including adaptive self-focused attention, clear seeing, open monitoring, and decentering by observing, allowing, and not reacting to automatic thoughts, feelings, and perceptions. Together, these transtherapeutic mindful processes intentionally cultivated through meditation offer a systematic means of exposing oneself to biases, preconceptions, self-limiting thoughts, and habitual mental, emotional, and behavioral tendencies that, left unexamined, can lead to faulty, narrow, and maladaptive self-views with consequences for everyday choices, behavior, and health.

Langer (2005) suggested that engaging in any activity wholeheartedly, without reservation, without judgment, and without fear of evaluation can inspire mindful creativity, spontaneous joy, and deep satisfaction that is rooted in authenticity and direct personal experience. The phenomenology of mindfulness meditation, viewed from the perspective that meditating can be an act of curiosity, interest, openness, and even delight, is therefore consistent with Langer's notion that engagement in any new activity can stimulate mindfulness, and the concomitant mental, physical, and behavioral health benefits that flow from it.

As a practical example to illustrate how mindfulness meditation, through mindful learning, can target transdiagnostic mental processes, take the case of substance use, abuse, or dependence. Addictions typically involve multiple, interacting transdiagnostic mental processes that can cause, exacerbate, or trigger relapse of disorder (Brewer, Elwafi, & Davis, 2013; Garland, Boettiger, & Howard, 2011). For instance, attention can be biased toward substance-related cues, which can feed into negative thinking (worry, obsession, catastrophizing), negative affect (anxiety, anger, depression), and inflexible, rigid appraisals about what must be done in order to cope with an emotional reaction or a harshly critical view of oneself. Paradoxically, attempts to suppress negative thoughts and emotional reactions, and to avoid uncomfortable physical sensations like tension or withdrawal symptoms, seem to magnify the very sources of distress one wishes to avoid, often leading to greater craving and substance use. Consequently, even though using a drug to provide a feeling of greater calmness or comfort can work temporarily, it negatively reinforces substance use as form of behavioral dysregulation. We propose that mindfulness training specifically, and efficiently, targets multiple transdiagnostic mental processes implicated in substance misuse, and other stress-related mental and medical disorders.

Mindfulness-based interventions like MBRP and Mindfulness-Oriented Recovery Enhancement are gaining empirical support for treating substance-use disorders, and improving rates of recidivism (Bowen et al., 2010; Garland, 2013). Recent reviews (Brewer, Elwafi, et al., 2013; Garland et al., 2011; Khanna & Greeson, 2013; Witkiewitz, Lustyk, & Bowen, 2013) also spoke to potential mechanisms of change, which appear to involve transtherapeutic mindful processes listed in Table 28.1. These processes include: (1) mindful exposure to distressing thoughts, emotions, or addiction-related triggers without reacting to them (i.e., urge surfing); (2) flexibly reappraising negative self-judgments or situational limitations as opportunities to see things differently (i.e., an opportunity for learning, meaning, or growth); and (3) purposefully cultivating positive emotions through loving-kindness to foster a sense of connection, shared experience, and self-in-context.

Hence, one can view mindful learning through mindfulness meditation practice as a vehicle for therapeutic change on multiple levels in the context of substance use, abuse, or dependence. Given that transdiagnostic mental processes functionally underlie vulnerability to many other emotional disorders, including depression, anxiety disorders and PTSD, eating disorders, and self-harm, transdiagnostic treatments including mindfulness training offer promising avenues of further research attention and clinical translation (Barlow et al., 2011; Farchione et al., 2012; Garland, 2013; McKay, Fanning, & Zurita Ona, 2011; Sauer-Zavala et al., 2012).

Conclusions and Future Directions

The history of science is rich in example of the fruitfulness of bringing two sets of techniques, two sets of ideas, developed in separate contexts for the pursuit of new truth, into touch with one another. (Oppenheimer, 1953)

From both Eastern and Western views, mindfulness cultivates learning (Kabat-Zinn, 2005; Langer, 1997). From the perspective of mindful learning, uncertainty means possibility for change, including the possibility of adopting a new perspective on the mind, on oneself, and on one's context of ever-changing life conditions. According to Langer (1997), "A mindful approach to any activity has three characteristics: the continuous creation of new categories; openness to new information; and an implicit awareness of more than one perspective." As we have described in this chapter, Langer's view parallels the core principles and practices involved in mindfulness meditation practice, where one is encouraged to become aware of mental percepts, including thoughts, feelings, judgments, evaluations, and impulses, without identifying with them (Grossman & Van Dam, 2011; McCown et al., 2010). Consistent with the process of mindful learning, mindfulness meditation practice offers a systematic method for developing a fundamentally new perspective that "thoughts are not facts" (Segal, Williams, & Teasdale, 2002), we can have "thoughts without a thinker" (Epstein, 2004), and "we have more possibilities available in each moment than we realize" (Nhat Hanh, as quoted by Miller, 2004). Using mindful learning as a lens through which to view two different traditions of wisdom, one can come to see the transtherapeutic qualities of mindfulness, as they apply across conditions.

But will those who are suffering from psychological distress be inclined to meditate, or stick with meditation long-term? Can mindful learning through meditation practice actually be rewarding? Both Brewer, Davis, and Goldstein (2013) and Langer (1997) point out that because the mind tends to wander and seek variety, concentrated attention is itself not naturally rewarding. However, according to these same scholars, becoming interested and curious while paying attention during meditation can lead to greater joy, tranquility, concentration, and equanimity. Because focused, concentrated attention is considered an instrumental part of the foundation by which mindfulness meditation engenders open awareness, insight, and wise action, approaching meditation with an attitude of interest, curiosity, and novelty can support the creative process of awakening, discovery, and well-being.

Although neuroscience research and personal meditation practice both reveal that people tend to be mindless and reactive by default (Farb et al., 2012; Kabat-Zinn, 1990), mindfulness training does offer an opportunity to grow, analogous to Langer's (2005) personal renaissance detailed in *On Becoming an Artist*. Based on a functional understanding of transdiagnostic mental processes, and the rigid thoughts, beliefs, and behaviors that exemplify them, one can therefore frame mindful learning as a therapeutic process by which one comes to see things from a new perspective, becomes more psychologically flexible, and, with practice, frees oneself from previously limiting perceptions that underlie unhappiness or dis-ease. As described by Kristeller (2007), "With the suspension of our usual, conditioned, or overly determined responses, we

may experience an increased emergence of more novel, creative, or ‘wiser’ perspectives on life challenges.” The implications of mindfulness meditation training for research and clinical practice, therefore, are significant.

From a research standpoint, taking a functional view of transdiagnostic mental processes is reflected in current funding priorities at the NIMH, which now aims to better understand cognitive, affective, neural, genetic, and other biobehavioral mechanisms that underlie mental disorders (Insel et al., 2010). Scientific investigation of mindfulness training as a transtherapeutic approach for ameliorating transdiagnostic mental processes could be considered high priority from this new functional view of mental health and illness. Moreover, if research continues to demonstrate that mindfulness training produces therapeutic benefits across a wide range of mental and medical disorders, as has been suggested to date, then there could be substantial implications for shifts in healthcare coverage and health policy (McCabe Ruff & Mackenzie, 2009). However, some of the major barriers to clinical research on mindfulness training include a lack of consensus on how to operationally define mindfulness, how best to assess mindfulness, and whether intervention-related outcomes can be specifically attributed to mindfulness practice (or mindfulness itself), rather than to nonspecific effects of social support, health education, or relaxation (Baer, 2007; Chiesa, 2012; Davidson, 2010; Grossman & Van Dam, 2011).

Future studies, and ongoing clinical experience, will be needed to further explore the potential value of taking a transdiagnostic view of mental disorders, considering mindfulness as a transtherapeutic process, and looking through the lens of mindful learning to see ever-new possibilities for knowing, healing, and growing.

People suffer because they are caught in their views. As soon as we release those views, we are free and we don’t suffer anymore. (Hanh, 1998)

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