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### Authors

Garland, Eric L  
Farb, Norman A  
Goldin, Philippe R  
[et al.](#)

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## Mindfulness Broadens Awareness and Builds Eudaimonic Meaning: A Process Model of Mindful Positive Emotion Regulation

**Eric L. Garland,**  
University of Utah

**Norman A. Farb,**  
University of Toronto

**Philippe Goldin,** and  
University of California - Davis

**Barbara L. Fredrickson**  
University of North Carolina - Chapel Hill

Eric L. Garland: eric.garland@socwk.utah.edu; Norman A. Farb: norman.farb@utoronto.co; Philippe Goldin: pgoldin@ucdavis.edu; Barbara L. Fredrickson: blf@unc.edu

### Abstract

Contemporary scholarship on mindfulness casts it as a form of purely non-evaluative engagement with experience. Yet, traditionally mindfulness was not intended to operate in a vacuum of dispassionate observation, but was seen as facilitative of eudaimonic mental states. In spite of this historical context, modern psychological research has neglected to ask the question of how the practice of mindfulness affects downstream emotion regulatory processes to impact the sense of meaning in life. To fill this lacuna, here we describe the *Mindfulness-to-Meaning Theory*, from which we derive a novel process model of mindful positive emotion regulation informed by affective science, in which mindfulness is proposed to introduce flexibility in the generation of cognitive appraisals by enhancing interoceptive attention, thereby expanding the scope of cognition to facilitate reappraisal of adversity and savoring of positive experience. This process is proposed to culminate in a deepened capacity for meaning-making and greater engagement with life.

### Keywords

affective science; broaden-and-build; emotion regulation; eudaimonic well-being; interoception; mindfulness; Mindfulness-to-Meaning Theory; positive emotion; post-traumatic growth; reappraisal; upward spiral

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A common misperception is that Buddhism uniformly denies the value of stimulus-driven pleasures, as if it were morally wrong to enjoy the simple pleasures of life,

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Corresponding author: Eric Garland, College of Social Work and Huntsman Cancer Institute, 395 South, 1500 East, University of Utah, Salt Lake City, UT 84112.

let alone the joys of raising a family, creating fine works of art, or making scientific discoveries... The enjoyment of such transient experiences is not in opposition to the cultivation of positive attitudes and commitments or the cultivation of the types of mental balance that yield inner well-being. In fact, one may derive greater enjoyment from hedonic pleasures as a result of cultivating well-being.” (p. 692).

Mindfulness training has grown increasingly popular in the West by isolating meditative practices from their traditional soteriological context. By eschewing ethically prescriptive content, manualized mindfulness programs have found traction in clinics and communities worldwide. Yet in avoiding prescription of particular values and virtues, contemporary theories of mindfulness are left strangely silent on the generative manifestations of training-related change. Indeed, most scientific models of mindfulness offer a primarily eliminative account of how mindfulness functions, focusing on the extinction of maladaptive habits and disengagement from negative states of mind rather than the cultivation of adaptive behavior and positive states of mind. While extinction and disengagement seem to be important components of mindfulness’ efficacy (Hölzel et al., 2011), an exclusive focus on the reduction of negative mental states and behaviors provides an incomplete account of how mindfulness engenders lasting positive change.

Consequently, modern psychological research on mindfulness has largely neglected to ask the question of how the acute state of mindfulness during meditation affects downstream positive emotion regulatory processes to promote meaning in life. Although scientific advances have elucidated the cognitive, affective, and neurobiological correlates of the meditative states evoked by mindfulness practice (Tang, Hölzel, & Posner, 2015), less is known about what happens when practitioners “get off the cushion” and refocus on their autobiographical selves constituted by language and personal narratives. This narrative orientation is an imperative, insofar as the attribution of semantic and episodic meaning to experience is fundamental to psychological development in Western society (Vygotsky, 1978), allowing for negotiation of the socio-cultural environment. Thus, while contemporary scholarship claims that mindfulness techniques decrease semantic-evaluative processing (Brown & Ryan, 2003; Hölzel et al., 2011; Kabat-Zinn, 1990), we argue that Westerners will inevitably reengage with cognitive appraisals of self and world following the acute phase of mindfulness practice. Psychological science has yet to thoroughly examine how the practice of mindfulness impacts appraisal and meaning-making processes as the culturally-embedded, autobiographical self navigates through life’s challenges. In this paper, we argue that mindfulness promotes positive reappraisal, a salutary form of evaluative cognitive-affective processing, to enhance eudaimonic well-being. Unlike hedonic approaches to happiness, which depend on obtaining pleasure and avoiding pain, eudaimonic well-being is characterized by a sense of purpose and meaningful, positive engagement with life that arises when one’s life activities are congruent with deeply held values even under conditions of adversity (Ryan & Deci, 2001; Rhyff, 2014). We propose that through the mechanism of reappraisal, mindfulness may generate eudaimonic meaning and foster flourishing in life.

We note that this thesis deviates significantly from the prevailing scholarly focus on mindfulness as a form of strictly non-conceptual attention and non-judgmental awareness. As such, the contention that mindfulness promotes rather than extinguishes downstream

evaluative processes has sparked heated debate. Indeed, some contemporary psychological scientists assert that mindfulness is antithetical to reappraisal (Brewer, Elwafi, & Davis, 2012; Chambers, Gullone, & Allen, 2009). From this view, linking mindfulness and positive reappraisal may seem contradictory, as reappraisal introduces judgments to an ostensibly non-evaluative process. These concerns are important for the clear definition of mindfulness as a discrete psychological construct. On the other hand, we argue that focusing narrowly on the non-conceptual, non-evaluative aspects of mindfulness may obscure its broader purpose of engendering eudaimonic meaning - and a complete account of mindfulness must therefore detail how attention training helps to realize this goal.

In the discussion below, we aim to advance an account of mindfulness training informed by affective science that includes both eliminative and generative mechanisms for human development. Whereas positive psychological states and behaviors may spontaneously arise with the elimination of maladaptive habits, we argue that such outcomes are unlikely in the absence of generative mechanisms that provide novel cognitive frames to guide thought, feeling, and action. To achieve a more complete and balanced explanation of mindfulness-based personal transformation, we suggest that such a comprehensive model is necessary for understanding the therapeutic mechanisms of mindfulness in secular Western contexts. A complete psychological science of mindfulness must therefore account for the generation and maintenance of positive meaning if we are to understand and leverage the purported benefits of mindfulness training. To that end, we describe herein the *Mindfulness-to-Meaning Theory*.

## The Explanatory Gap in Models of Mindfulness

The rise of mindfulness in the West is supported by its promise to engender eudaimonic well-being (Brown & Ryan, 2003). Indeed, mindfulness practitioners report significantly higher levels of eudaimonic well-being than non-practitioners, levels which are associated with the propensity to be mindful in everyday life (Hanley, Warner, & Garland, 2014). The flourishing of mindfulness in fields such as medicine and healthcare may be in due, in part, to its potential eudaimonic benefits; yet, empirical reports have largely focused on the efficacy of mindfulness-based interventions for reducing psychological distress (Goyal et al., 2014). Initial evidence of beneficial outcomes led to the standardization of the Mindfulness-Based Stress Reduction (MBSR) training program (Kabat-Zinn, 1990), followed by the development of more specialized programs for persons with clinical disorders like Mindfulness-Based Cognitive Therapy (MBCT; Segal, Williams, & Teasdale, 2002), Mindfulness-Based Relapse Prevention (MBRP; Bowen, Chawla, & Marlatt, 2012), and Mindfulness-Oriented Recovery Enhancement (MORE; Garland, 2013).

In these programs, the central practice of mindfulness has been operationalized as cultivating an intentional, nonjudgmental form of attention focused on experience as it unfolds in the present moment (Kabat-Zinn, 1990). Through focus on momentary physical sensation and disengagement from mental proliferation, mindful attention is thought to extinguish habitual negative reactions (Bishop et al., 2004) – a primarily eliminative account that accords with a substantial literature on the regulatory benefits of psychological distance in the face of negative experience (Kross & Ayduk, 2011). In the mindfulness literature, the process of

achieving psychological distance has been referred to as decentering (Fresco, Segal, Buis, & Kennedy, 2007). In parallel, this shift from evaluative processing to non-judgmental awareness has been described in neuroscientific explorations as an increased integration of sensory information over neural systems for conceptual elaboration (Farb et al., 2007; Kilpatrick et al. 2011).

While providing a compelling explanation for some therapeutic effects of mindfulness, current models also exhibit an explanatory gap for how such nonjudgmental attention promotes eudaimonic well-being. Repeated practice in attending to physical sensation such as the breath may strengthen capacity for sustained sensory attention, as evidenced by neuroimaging findings suggesting enhanced processing of respiratory signals following mindfulness training (Farb, Segal, & Anderson, 2013). Consequently, cultivating sustained attention ought to reduce mind-wandering, and indeed improvements to attentional control and perceptual discrimination are quantifiable benefits of intensive meditation training (MacLean et al., 2010). While changes in these cognitive capacities correlate with improvements in well-being (Sahdra et al., 2011), they do not necessarily explain them – for example, it is unclear how sustained attention to a target such as the breath could enhance appraisals about the self or one's purpose in the world.

It is often argued that the purpose of mindfulness practices is not to build attentional capacities themselves, but instead to foster insight into one's maladaptive patterns of interpreting experience (Bishop et al., 2004). According to such accounts, by noticing one's habitual patterns of responding, a person can modify attentional habits – a potent emotion regulatory strategy in itself (Todd, Cunningham, Anderson, & Thompson, 2012). In that regard, mindfulness training has been associated with reduced attentional biases, particularly in response to negative stimuli (Vago & Nakamura, 2011; Garland & Howard, 2013). However, disengagement from fixation on negative events does not seem sufficient to promote eudaimonic well-being. The insufficiency of cognitive capacity-based accounts of mindfulness to provide an explanation for positive self-transformation towards eudaimonia is a non-trivial gap in scientific models of mindfulness.

The central question we address in this paper is how mindfulness training fosters eudaimonic responses to stress that engender a sense of meaningfulness in life. We propose that the practice of mindfulness evokes a metacognitive state that transforms how one attends to experience, thereby promoting positive reappraisals that facilitate positive affect and adaptive behavior. Our use of the term positive reappraisal is not intended to imply that mindfulness involves recasting inherently deleterious experiences as positive. Instead, the process of positive reappraisal that flows from mindfulness involves broadening the scope of appraisal to appreciate that even aversive experiences are potential vehicles for personal transformation and growth. Through this re-orienting to aversive experience, positive reappraisal provides meaningful experiences in the face of stress that complement and sustain the extinction of maladaptive cognitive habits.

In addition to modulating the regulation of aversive experience, we would also argue that positive reappraisal potentially improves savoring, the appreciation for positive experiences, and thereby enhances natural reward processing. Given traditional contemplative models of

mindfulness, we put forward the claim that focusing on positive experiences should not be taboo within contemporary mindfulness training, so long as this focus is not conflated with clinging to such experiences when they arise. Given descriptions of mindfulness as promoting happiness in addition to alleviating suffering (Brown & Ryan, 2003), a complete theory of mindfulness must account for the cultivation of positive mental states rather than focus exclusively on the reduction of negative states. Reappraisal and savoring may be skillful means of such cultivation.

## Why Reappraisal?

Outside of the mindfulness literature, reappraisal is already central to many contemporary theories of emotion regulation. For instance, reappraisal is a key construct in Lazarus and Folkman's seminal transactional model of stress and coping (1984), which holds that the experience of stress is cognitively-mediated. In subsequent research, reappraisal has emerged as one of the most powerful mechanisms for transforming affective experience (Gross & Thompson, 2007). According to the transactional model, humans appraise the significance of a given stressor relative to its context, and stress reactions arise from the appraisal that demands presented by the stressor exceed one's resources and therefore pose a threat to well-being or goal attainment (Lazarus & Folkman, 1984). Threat appraisals are often automatic (Ohman, Carlsson, Lundqvist, & Ingvar, 2007), resulting in negative emotions and stereotyped or habitual defensive behavior. By contrast, if the stressor is appraised to be navigable or controllable, such challenge appraisals will result in a sense of positive affect and self-efficacy (Lazarus & Folkman, 1984).

While stressful life events are often initially appraised negatively, with an influx of new data, they may be reappraised as innocuous or valuable, with consequent effects on emotion, physiology, and behavior. This cognitive strategy, known as *positive reappraisal*, is the adaptive process through which stressful events are re-constructed as benign, meaningful, or even growth-promoting (Lazarus & Folkman, 1984). In this paper, we propose the *Mindfulness-to-Meaning Theory*, which asserts that by modifying how one attends to the cognitive, affective, and interoceptive sequelae of emotion provocation, mindfulness introduces flexibility into the creation of autobiographical meaning, stimulating the natural human capacity to positively reappraise adverse events and savor the positive aspects of experience. By fostering positive reappraisals and emotions, mindfulness may generate deep eudaimonic meanings that promote resilience and engagement with a valued and purposeful life.

The seeds of this idea were sown in the modern scientific literature decades ago. Kabat-Zinn (1990) first posited that mindfulness could enhance positive cognitive-affective responses to stressors. Around this time, Teasdale (1993) concluded that negative emotions could be alleviated by accessing and transforming implicit, implicational meanings derived holistically from experience, and later, asserted that mindfulness might be a means of transforming such implicational meanings (Teasdale, Segal, & Williams, 1995). Since then, surprisingly little attention has been paid to the ways in which mindfulness may enhance eudaimonic meaning-making in stressful contexts to generate positive emotions. Drawing on insights from affective science, in the present paper we aim to expand on this earlier work by

further specifying this process and making a number of testable propositions regarding the manner in which mindfulness techniques promote positive psychological states in the wake of adverse life events.

To establish the basis for a conceptual framework in which mindfulness promotes eudaimonic well-being, we first ground our proposal in the affective science of reappraisal. We then detail a process model (c.f., Gross, 2015) of mindful positive emotion regulation which offers a temporally extended, dynamic account of the manner in which mindfulness modulates the attention-appraisal-emotion interface to promote meaning in the face of adversity. Finally, we situate our theoretical proposal in a traditional Buddhist perspective that likewise links the construct of mindfulness to that of insight, and thereby, to reappraisal.

## Mindful Reappraisal as a Process for Promoting Positive Therapeutic Change

### Hedonic adaptation and eudaimonic change

Though some people are traumatized by adverse life events, most demonstrate remarkable resilience under stressful conditions (Bonnano, 2004). Indeed, research shows that while hedonic experiences vary from day to day, one's sense of well-being remains consistent in the face of negative events, a process known as hedonic adaptation (Frederick & Lowenstein, 1999). Ratings of subjective well-being are 30–40% stable even over multiple decades (Diener & Lucas, 1999). Thus, fluctuations in daily emotion are often self-extinguishing in the form of a damped oscillator (Chow, Ram, Boker, Fujita, & Clore, 2005), tending to return to an individual set point via homeostatic mechanisms. Despite hedonic adaptation, human happiness is not entirely fixed (Lucas, 2007; Lyubomirsky, Sheldon, & Schkade, 2005). Indeed, a substantial subset of individuals report reliable increases in happiness across the lifespan, which appear to be related to focusing on non-zero sum goals (e.g., altruism, social activism) rather than monetary gains (Headey, 2008). The happiness-boosting effects of prioritizing eudaimonic goals over mere hedonic gratification suggests that practices that support eudaimonic ends may be especially important for positive changes in life satisfaction. Indeed, experiences of eudaimonic meaning may provide perturbations of sufficient intensity to shift a homeostatic affective system stabilized by negative feedback mechanisms into an autoregressive yet forwardly-progressing, self-reinforcing, resonant cycle of positive affect and cognition that elsewhere we (Garland, Fredrickson, Kring, Johnson, Meyer, & Penn, 2010) have described as an *upward spiral* of psychological resilience and flourishing.

The affective science of happiness (e.g., Fredrickson, 2013) therefore seems to offer two major principles for promoting upward spirals of stress resilience and positive change. First, hedonic adaptation appears to be an effective process for minimizing the psychological impact of negative life events. Second, a focus on eudaimonic goals may be critical for establishing a sustainable, positive trajectory of well-being. Recent work has in fact linked a relative emphasis on eudaimonic or hedonic pursuits to a genomic profile that is potentially health-generating (Fredrickson, Grewen, Coffey, Algoe, Firestine, Arevalo, Ma, & Cole, 2013; Fredrickson, Grewen, Algoe, Firestine, Arevalo, Ma, & Cole, 2015). In light of these

dual principles, we suggest that mindfulness training may facilitate adaptation and cultivate eudaimonia through a process of promoting positive reappraisal in stressful contexts. We propose that such “mindful reappraisal” occurs at multiple levels of temporal resolution, in keeping with iterative process models of emotional experience (Cunningham, Zelazo, Packer, & Van Bavel, 2007) and extended process models of emotion regulation (Gross, 2015). Immediately following a stressor, mindfulness attenuates negative attentional biases and maladaptive elaborative habits, allowing positive reappraisal to enter into the iterative emotion regulatory process to modulate the impact of a negative event. Over longer timescales, mindfulness enables reflective processes to magnify the affective benefits of positive reappraisal and generate eudaimonic well-being. Next, we outline evidence supporting positive reappraisal as an emotion-regulatory strategy, and detail mechanisms by which mindfulness might engender reappraisal.

### **Positive reappraisal as an adaptive cognitive change strategy**

While threat appraisals elicit the evolutionarily-conserved stress response, an important aspect of the human information processing system is to recognize threat resolution, countering excitatory sympathetic activity with parasympathetic activation (Porges, 2007). Consequently, the stress response is mutable, continuously reshaped as a function of the dynamic interplay between shifting situational demands and internal resources. Reappraisals modify the consequences of stress through dynamic feedforward mechanisms that alter the meaning of the stressor while calibrating behavioral responses to it. Following reappraisal, an event that was appraised as threatening may be reinterpreted as innocuous, benign, or even serving some greater purpose for self or others.

Positive forms of reappraisal may be central means of adapting to the rigors of life. Indeed, in the face of adverse conditions, people commonly believe that they have personally grown from dealing with the stressful event. In one estimate, 42% of a sample of adults reported having positively re-interpreted a life crisis, and 87% of this subset of individuals reported that facing the crisis had enriched their sense of positive meaning in life (Ebersole & Flores, 1989). Over half (51.1%) of a large sample of survivors (N = 2080) of the devastating 2008 earthquake in Sichuan province, China reported having experienced meaningful growth in its wake, including a sense of appreciation of life, an opening to new possibilities, or the development of personal strength (Xu & Liao, 2011). Similarly, after a deadly tornado struck Madison, Florida in 1988, 90% of survivors reported receiving some form of benefit from undergoing the experience, such as personal growth or enhancing closeness with others (McMillen, Smith, & Fisher, 1997) - history is replete with such examples. Profound interpersonal challenges are also often met with positive reappraisal; for example, Folkman (1997) found that many caregivers of partners with HIV held the belief that the shared experience of illness had allowed them to develop deep levels of intimacy with their partners that might not have been possible in the absence of the illness. Yet, finding positive meaning in adversity does not only occur in the aftermath of disasters and serious relational adversity; it also commonly occurs in the face of daily stressors. For instance, after being rudely snubbed by a work supervisor, one might reappraise the mistreatment into an opportunity to realize the value of being sensitive to the opinions and perspectives of others.

Thus, positive reappraisal is not merely a form of saccharine “positive thinking” or a wishful denial of reality. Instead, positive reappraisal may involve a reframing of stressful events as inherently meaningful for personal growth and development – a means of learning and developing resilience out of the encounter with adversity. Meta-analyses reveal that positive reappraisal, alternately conceptualized as benefit-finding (Affleck & Tennen, 1996) or post-traumatic growth (Tedeschi & Calhoun, 2004), is significantly associated with lower levels of distress and improved mental health outcomes (Helgeson, Reynolds, & Tomich, 2006), and tends to increase the ratio of positive to negative affect in response to stressors (Shiota & Levenson, 2012). Positive reappraisal has salutary influences on stress physiology, including immune, neuroendocrine, and cardiovascular parameters (Bower, Low, Moskowitz, Sepah, & Epel, 2008), and enhances top-down, prefrontal cortical regulation of limbic circuitry subserving negative affect (Ochsner & Gross, 2005). Importantly, positive reappraisal is not a defense mechanism used to suppress unwanted experience. To the contrary, it is an active coping strategy that involves direct contemplation of the stressor and its context (Folkman, 1997). As such, studies indicate that positive reappraisal has a distinct physiological signature characterized by increased parasympathetic nervous system activation, unlike suppression which leads to a physiological state characterized by sympathetic dominance (Gross, 2002; but see Witvliet et al., 2011).

In contrast to suppression and other avoidant coping strategies, positive reappraisal is often a critical step towards an active reengagement with the stressor. To illustrate, a person stricken with a non-fatal myocardial infarction might positively reappraise the event as a chance to modify their lifestyle and consequently begin to change their diet and exercise behaviors. A person who has recovered from an incident of sexual victimization might view their survival of the assault as evidence of their strength and resilience, and they might decide to dedicate their life to helping others make similar recoveries. A person embroiled in an argument with a spouse might initially vilify him and recoil from his attempts to resolve the conflict, and then, after recognizing his unwavering devotion to their relationship, redouble her efforts to understand his position. Hence, positive reappraisal is an adaptive and approach-oriented strategy.

### **The role of mindfulness in positive reappraisal**

The emotional processing of stressful life events is dynamic, involving the engagement, adaptation, and re-engagement of attentional and appraisal mechanisms that subserve the valuation process (Gross, 2015). Initial appraisals flow from orienting attention to the stressor and the subsequent triggering of learned stimulus-outcome associations, which include both implicit associations, as well as declarative, explicit interpretations of the meaning of the stimulus grounded in schemas, beliefs, and goals (Ellsworth & Scherer, 2002). However, when attention shifts from the stressor to the interpretive context in which it is experienced, reappraisal may occur, modifying the dynamic unfolding of habitual associative responses by introducing information that alters the interpretive context for the triggering stimulus and the core affective state. The reframed stimulus or one’s emotional response to it may then serve as novel inputs into the valuation process, triggering a new iteration of interpretive associations distinct from the initial associative response. In this way, the co-activation and interaction of valuation systems can result in effective emotion

regulation. Critically, reappraisal requires an influx of novel information with which to reformulate the original stress appraisal (Lazarus & Folkman, 1984). Yet, negative emotions narrow attention (Gable & Harmon-Jones, 2010), elicit habitual responding (Schwabe & Wolf, 2009), and bias information processing toward negative mental content and environmental features (Garland et al., 2010), making reappraisal difficult to employ. An effortful attentional stance may be required to access new, hopeful perspectives in the presence of emotionally-charged stimuli that reflexively fixate attention onto adverse contextual circumstances.

We argue that mindfulness is a key factor that can allow stimulus reframing to enter into the appraisal process (Garland, 2007; Garland, Gaylord, & Park, 2009). In the first stage of this process, mindfulness disrupts default activation of schemas and scripts to allow for flexible selection of appraisals. In this capacity, mindfulness interrupts automatic conditioned reactions, allowing for conscious reflection. By interrupting scripted defensive responses to an appraised stressor, it is possible to re-evaluate the context in which initial stress appraisals are made. Thus, mindfulness provides a buffer from immediate, automatic reactivity, thereby clearing working memory (Teasdale & Chaskalson, 2011) and providing “psychological space” for greater perspective taking and cognitive set shifting – the foundation of reappraisal.

The set shifting feature of mindfulness involves decentering from thoughts, emotions, and sensations into a metacognitive state of awareness (Teasdale et al., 1995). This mental operation may be a key link between appraisal and reappraisal, involving a shift in attention from the contents of consciousness to the process of consciousness itself. In this sense, mindfulness involves a mode of apperception in which one monitors the object of cognition as well as the meta-level of awareness in which dynamic models (e.g., schemas) of the object level are contained (Nelson, Stuart, Howard, & Crowley, 1997). In other words, as one decenters from distressing psychological content, one continues to monitor the contents of consciousness while becoming aware of the quality of awareness itself – becoming aware, for example, of how one is or is not paying attention to the subtle, ever-changing mental phenomena that constitute each moment of consciousness. As a result of decentering into this metacognitive state, one may come to the fundamental realization “thoughts are not facts” (Segal, Williams, and Teasdale, 2002).

Through decentering, mindfulness is thought to lead to dis-identification from thoughts and emotions, liberating awareness from schematized narratives about self and world, and promoting flexible selection of adaptive responses (Shapiro, Astin, Carlson, & Freedman, 2006). Studies suggest that the psychological distance afforded by this process may facilitate meaning making in response to negative events (Kross & Ayduk, 2011), which in turn reduces distress over thoughts and emotions elicited by these events (Kross & Ayduk, 2008). Moreover, viewing experiences at a psychological distance facilitates non-threatening reflection on negative events, increases openness to alternative viewpoints, and fosters reasoning (Kross & Grossman, 2012). Thus, decentering, as a form of psychological distance, may promote re-construal of experience by taking the “big picture” into account to engender insight and closure (Kross & Ayduk, 2011).

We theorize that mindfulness may engender positive reappraisal by virtue of its purported ability to disrupt automatic appraisal and reactivity, creating psychological distance that is fertile ground for constructive reframing of one's circumstances. The unfolding of this *mindful reappraisal* process is depicted in Figure 1. First, in order to re-construe an appraisal of an adverse event as positive, one must suspend the initial stress appraisal and disengage cognitive resources from it – in essence, “letting go” of the appraisal and its affective concomitants by viewing them from a metacognitive vantage point that quells prior semantic evaluations associated with the offending stimulus. This decentering process may be initially cued by stress-evoked perturbations to bodily homeostasis interpreted as negative affect (Friedman, 2010), or by social feedback indicating that one has come into the grip of strong emotions. The optimal ‘dose’ or duration of decentering required may depend upon the intensity of the stressor and the strength of the conditioned response that the practitioner is attempting to moderate. Over time, decentering from stress appraisals into the state of metacognitive awareness may extinguish conditioned responses, as one focuses attention on one's relation to the conditioned stimulus rather than fulfilling the conditioned response. Through iterative reprocessing of stressors, mindful attention may facilitate extinction learning of habitual responses, though admittedly the temporal dynamics that govern such extinction are far from understood (Williams, 2010).

Further, mindful attention may release attentional fixation from rumination on the stressor while enhancing sensory awareness of stressor's broader, socio-environmental context. Indeed, mindfulness has been empirically associated with increased attentional disengagement from emotionally-salient stimuli (Garland & Howard, 2013), cognitive flexibility (Moore & Malinowski, 2009), and attentional re-orienting capacity (Jha, Krompinger, & Baime, 2007). Thus, theoretically, as one decenters into the metacognitive state, attention is no longer narrowly constricted, but instead broadens to encompass the stressor as well as previously unattended contextual information. In support of this claim, mindfulness has been associated with improved detection of changes in stimulus sets (Hodgins & Adair, 2010).

The attentional broadening afforded by mindfulness practice may derive from direct effects on the dorsal and ventral attention streams in the brain (Hölzel et al., 2011). Alternatively, in light of evidence that low-approach motivated positive affective states (e.g., contentment and satisfaction) can broaden cognition (Harmon-Jones, Gable, & Price, 2013; Fredrickson & Branigan, 2005), this cognitive broadening may be in part an indirect effect of the positive emotions induced by mindfulness meditation. Contrary to some modern characterizations that paint it as producing an austere, affectively-neutral state of bare attention, mindfulness has been traditionally described as engendering positive or pleasurable qualities such as serenity, appreciation, gratitude, happiness, joy, or even bliss (Namgyal, 2006).<sup>1</sup> In that regard, a number of observational studies (Schroevers & Brandsma, 2009; Orzech, Shapiro, Brown, & McKay, 2009) and randomized controlled trials (Geschwind, Peeters, Drukker,

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<sup>1</sup>Nonetheless, at certain stages of contemplative practice, mindfulness meditation may evoke acute or persistent psychological distress, experiences of depersonalization, intense negative emotions, and existential terror. These “dark night of the soul” experiences may provide fodder for developing a more profound compassion for the suffering of others, and this connectivity with others may in turn provide the basis for positive emotions and eudaimonic well-being.

vas Os, & Wichers, 2011; Henderson et al., 2012; Nyklík & Kuijpers, 2008; Zautra et al., 2008; Davis & Zautra, 2013) demonstrate effects of mindfulness on increasing positive emotion. Such findings of mindfulness-induced increases in positive emotions may be the result of training-related changes in brain function. In that regard, Davidson et al. (2003) observed significantly greater asymmetrical left anterior prefrontal cortex activation, a known neural correlate of approach-related, and generally positive emotions, among participants randomized to MBSR compared to persons randomized to a wait-list control group. Similarly, brief mindfulness training led to frontal asymmetric electroencephalographic activation associated with positive emotion (Moyer et al., 2011). Moreover, a recent case study of an advanced Buddhist practitioner found that meditation-induced joy coupled with activation of the mesolimbic reward system (Hagerty, Isaacs, Brasington, Shupe, Fetz, & Cramer, 2013). We hypothesize that the positive emotions and accompanying neural signatures evoked by mindfulness may provide a signal which tunes the attentional system to detect stimuli that are congruent with the induced emotional state.

As a result of this broadened scope of attention and the tuning of the attentional system toward the positively-valenced aspects of self and world, the individual may access new data with which to reappraise circumstances as benign, meaningful, or growth-promoting. Indeed, brief mindfulness induction has been shown to reduce negativity bias by increasing positive judgments of neutral stimuli (Kiken & Shook, 2011), and improves positive emotion information processing (Roberts-Wolfe, Sacchet, Roth, & Britton, 2012). Attending to the positive aspects of the situation may result in additional positive emotions, which magnifies positive reappraisal (Tugade & Fredrickson, 2004). Indeed, attention to positive stimuli and positive reappraisals are known to hasten recovery from negative emotional arousal (Fredrickson, Branigan, Mancuso & Tugade, 2000; Tugade & Fredrickson, 2004). From the broadened, metacognitive state of mindfulness, positive features of the event or context which had been previously unnoticed may now become accessible to consciousness as the “stuff” of which reappraisals are made.

While mindfulness practice may temporarily suspend evaluative processing, because the human mind is embedded in narratives which reduce uncertainty and produce a coherent life story (Olivares, 2010), it is inevitable that one will re-engage a semantic-linguistic mode as they integrate the encounter with the stressor into autobiographical memory. The psychological distance afforded by mindfulness may allow for self-reflection that generates a sense of closure or reckoning with the experience. As one returns to this narrative mode from the mindful state, reappraisals may arise either through a conscious process of reflection or through automatic processes grounded in working memory for intuitive meanings, based on spontaneous insights. As Teasdale and Chaskalson (2011) state: “mindfulness is characterized by configurations of cognitive processing in which working memory for implicit, intuitive meaning plays a central role; when mindfulness transforms suffering by changing the way experience is processed or viewed, the integration of information into new patterns within this working memory plays a central role” (p. 109). As the result of positive emotional tuning of the information processing system, the new appraisals emerging from self-reflection or insight will tend to have a positive valence. As detailed later in this paper, such reappraisals result in positive emotions, leading to a

deepened sense of eudaimonic meaning and motivation to engage in prosocial or valued actions.

We have just described a single iteration of the mindful positive emotion regulation process. However, both within and across emotion regulation episodes (which may extend from seconds to minutes, hours, and even days), multiple iterations of this process are likely to unfold, as the individual continues to practice mindfulness to contemplate and “sit with” the meaning of stressor event. We (Garland, Fredrickson, et al., 2010) and others (e.g., Chambers et al., 2009) have hypothesized that the repeated, intentional engagement of the metacognitive state of mindfulness via mindfulness practice may result in the development of trait mindfulness over time, a proposal which has been supported by empirical research (e.g., Carmody, Baer, Lykins, & Olendski, 2008). Subsequently, as a practitioner develops greater mindful dispositional and positive affectivity (plausibly mediated by meditation-induced neuroplasticity) we hypothesize that he or she will be more likely to make positive reappraisals in the face of distress as a habitual cognitive coping style. In contradistinction to this notion, some theorists suggest that as mindfulness practitioners develop expertise, they abandon reappraisal in favor of non-elaborative and non-conceptual forms of cognitive processing (e.g., Hölzel et al., 2011). Congruent with this claim, according to Tibetan Mah mudr tradition, the highest levels of meditative attainment are marked the mind resting in an unmodulated state while simultaneously monitored by an clear and unwavering, “non-cognizing” awareness (Namgyal, 2006). Given this possibility, there may be a u-shaped function that describes the progressive adoption, strengthening, and later relinquishment of positive reappraisal strategies. On the other hand, recent research indicates that meditation practice frequency and duration are positively correlated with mindful reappraisal use among practitioners from a wide range of contemplative (Buddhist and non-Buddhist) traditions (Hanley, Garland, & Black, 2013). Clearly, these are empirical questions that merit further study.

## **A Neural Account of How Mindfulness Promotes Reappraisal via Interoceptive Recovery**

Findings from neuroscience may bolster our claim that mindfulness facilitates positive reappraisal. While positive reappraisal may be readily initiated in low-arousal, transitory negative contexts, such attempts may become difficult or impossible within high-arousal or chronic negative contexts. For instance, when a person is confronted with stressors while entangled in a downward spiral of negative mood (Garland et al., 2010), the concomitant narrowing of attention and increasing negativism of emotional context serve to perpetuate negative appraisals (Figure 2, Panel A). Because the context for appraisal becomes increasingly negative over time due to attentional and interpretational biases which deprive the individual from positive inputs, attempts to positively reappraise events also become less frequent; indeed, depressed individuals are more likely to attempt suppression strategies than reappraisal, although suppression tends to be ineffective in reducing distress (Ehring et al., 2010). This tendency towards suppression is associated with greater amygdala activity (Abler et al., 2010), and in treatment-resistant depression even instructed reappraisal fails to regulate limbic activity (Johnstone et al., 2007), which in turn may foster cognitive

elaboration on negativity (i.e., rumination) and ironically exacerbate emotional distress, resulting in a move further down the spiral (Figure 2, Panel B). For such individuals, reappraisal may seem unattainable.

This difficulty may arise when stress activates powerful automatic response systems in the brain that evoke cognitive elaboration and obscure body awareness. Provocation of negative emotions activates cortical midline regions of the brain related to self-representation (Grimm et al. 2009; Farb et al. 2010), which in turn is associated with elevated risk of relapse to depression (Farb, Anderson et al. 2011). Conversely, neural representations of somatovisceral sensations may be suppressed during emotional challenge; this loss of interoceptive representation is associated with greater depressive symptom severity (Farb et al., 2010). The recovery of interoceptive representations may afford a broader sense of context while appraisal is taking place, and thus is a strong candidate mechanism for the cognitive experience of decentering.

We propose that decentering through mindfulness meditation acts to reset the emotional context back to a low arousal, neutral state grounded in previously unappraised visceral sensations that are neither negatively nor positively valenced. This process operates through the neural principle of *interoceptive recovery*: a restoration from suppression of viscerosensory brain circuits following emotional challenge (Farb et al., 2010). Rather than attempting to reverse the tide of negative appraisals, decentering fundamentally shifts a person's regulatory orientation from appraisal to attending to perceptions of external stimulus contexts and concurrent visceral sensations (Figure 2, Panel A). This shift is important, because in neural terms, moving down the spiral involves a loss not only of positively appraised representations, but also of unappraised perceptions from which new appraisals may be generated. Appraisals leading to despair and hopelessness constrain attention to focus further only on sensations and other perceptual contents that confirm these dysphoric implications (Teasdale et al., 1995) (Figure 2, Panel B).

Such appraisal tendencies may be characterized through analysis of prefrontal cortical (PFC) responses to experimental stimuli, both in terms of the particular sub-regions of PFC that are activated, and also the neural regions that become functionally connected to the PFC during the response. In particular, appraisals of self-relevance have been associated with both dorsal and ventral aspects of the PFC (Schmitz & Johnson, 2006). During self-referential tasks, the ventral PFC is functionally connected with limbic and paralimbic regions such as the nucleus accumbens, amygdala, and insula, regions implicated in monitoring affective and motivational relevance, whereas the dorsal PFC is connected an executive control network independent from affective content (Seeley et al., 2007). Activation and/or connectivity to the ventral PFC corresponds to affective judgments, whereas activation and/or connectivity to the dorsal PFC corresponds to monitoring without necessitating positive or negative appraisals.

A series of neuroimaging studies supports the hypothesis that mindfulness training initially reduces appraisal tendencies in favor of unelaborated attentional monitoring. First, mindfulness training appears to increase connectivity within sensory cortices (Kilpatrick et al., 2011), including primary interoceptive cortex in the insula (Farb et al., 2013), suggesting

that mindfulness may restructure sensory representation. Second, mindfulness training is associated with altered connectivity between primary sensory regions such as the posterior insula and the PFC, such that connectivity to ventral, affective processing regions is reduced (Farb et al., 2007), but connectivity to dorsal, attentional control regions is augmented (Farb et al., 2013; Froeliger et al., 2014). The shift in connectivity from ventral to dorsal PFC regions suggests a movement away from appraising a sensation's affective salience in favor of unelaborated monitoring, consistent with the formal instructions found in mindfulness training programs.

In the context of emotion challenges, changes in sensory appraisal may be particularly important. For example, in the Farb et al. (2010) study, insula suppression following sad mood provocation was correlated with heightened depressive symptoms, whereas participants who had completed mindfulness training demonstrated reduced depressive symptoms and a recovery of insula activity. Thus, rather than attempting to operate on deeply reinforced negative meanings through an appraisal orientation, decentering involves disengaging from appraisal, and instead orienting attention mindfully to momentary awareness of unappraised sensations and perceptions (Figure 2, Panel C). Two such sensory targets include attention to the breath, which may carry the implicit meaning that one is alive and safe, and the sensation of the feet against the ground, which may carry the connotation of being “grounded” and “steady” despite the many upsets in life. As mindfulness practice is prolonged, associations between sensations and habitual negative appraisals weaken, providing decentered experience of momentary sensation. In effect, working memory is cleared and the appraisal context is ‘reset’ to one of unappraised sensation framed within a positively-valenced implicational context (Teasdale, 1993) of safety and groundedness.

The critical reason that decentering may work when appraisal becomes overdetermined by a negative context is that decentering does not rely upon conceptual information. The process of interoceptive recovery appears to engage attentional systems in the brain that eschew reliance upon elaborative prefrontal cortical systems in favor of a more direct access to knowledge of the body's internal state, constituted by neural representation regions in the insula, cingulate, and hippocampus (Farb et al., 2012). Encouragingly, while the capacity to attend to internal sensation appears to be a natural human ability, the tendency to engage in interoceptive processing in the face of stressors seems to be enhanced through mindfulness training (Farb et al., 2010). Decentering appears to operate by restoring neural balance between conceptual and sensory representations, serving to broaden attentional context amidst stressors and thereby promote interpretive flexibility. The consequence of such decentering practices is a return to a neutral emotional context (or even a positive context, in the case when mindfulness produces pleasurable feeling states such as relaxation, contentment, or joy), achieved through a gradual extinction of negative appraisal habits. By refocusing on previously unappraised visceral sensations instead of negative appraisals, attention is then able to widen to include a variety of internal and external sensory targets, allowing for novel, adaptive reappraisals of stimuli that were previously construed only as reinforcing negative expectations and meanings (Figure 2, Panel D).

Speculatively, this “mindful reappraisal” process may involve spreading activation in a number of brain networks. Generating the state of mindfulness in the midst of a negative

affective state may initially activate the dorsal ACC and dorsolateral PFC (Chiesa & Serretti, 2010), which could facilitate metacognitive monitoring of emotional reactivity, attentional disengagement from negative appraisals, and regulate limbic activation. In so doing, the acute state of mindfulness may attenuate activation in brain areas that subserve self-referential, linguistic processing during emotional experience (e.g., mPFC) while promoting interoceptive recovery from negative appraisals by increasing activation in the insula (Farb et al., 2010). Metacognitive disengagement from the initial negative appraisal is accomplished through an attentional shift towards non-elaborative processing of somatic and sensory information. Disengagement may then free processing resources for the set shifting function of cognitive reappraisal. In neural terms, this function is accompanied by a dynamic shift from posterior to anterior regions of prefrontal cortex during a reappraisal episode, implicating cognitive control mechanisms for attenuating emotional interference while allowing alternate appraisals to be retrieved from memory and evaluated for goodness-of-fit with situational demands and one's autobiographical narrative (Kalisch, 2009).

This process may exemplify the dynamic adjustment of emotion regulation sequences that Gross (2015) highlights as necessary for regulatory flexibility (Bonanno & Burton, 2013) and goal attainment in emotionally intense situations. Optimal regulatory flexibility may require initial disengagement from elaborative self-referential processing through mindfulness as a precursor to elaborative metacognitive reflection on the self-in-context when hedonic drives need to be balanced with one's eudaimonic goals and values (Mennin & Fresco, 2015).

### **Evidence for a Link between Mindfulness and Positive Reappraisal**

Our central hypothesis that mindfulness promotes positive reappraisal has been supported by cross-sectional, observational, laboratory-based, and randomized controlled trials. Cross-sectional research indicates that reappraisal mediates the association between dispositional mindfulness and depressive symptoms among patients with psychiatric disorders (Desrosiers, Vine, Klemanski, & Nolen-Hoeksema, 2013). Relatedly, among patients with substance use disorders, the inverse association between trait mindfulness and craving was partially mediated by positive reappraisal (Garland, Roberts-Lewis, Kelley, Tronnier, & Hanley, 2014). Moreover, in the largest cross-sectional study of this phenomenon to date ( $N = 819$ ), across five diverse samples including college students, alcohol dependent adults, and chronic pain patients, trait mindfulness was correlated with positive reappraisal ( $r = .41$ ), even after controlling for positive affect (Hanley & Garland, 2014). A similar pattern holds for mindfulness practitioners; indeed, individuals with contemplative practice experience report significantly higher levels of post-traumatic growth than non-practitioners, and the correlation between trait mindfulness and post-traumatic growth is significantly stronger among practitioners than non-practitioners (Hanley, Peterson, Canto, & Garland, 2015). In that vein, a recent survey revealed that more than half of a sample of 118 meditation practitioners from a variety of contemplative traditions reported regularly using mindfulness to enhance positive reappraisal of stressful life events, and frequency of mindful reappraisal was significantly positively correlated with practice experience and meditation frequency (Hanley, Garland, & Black, 2013).

With regard to evidence derived from observational studies, we (Garland, Gaylord, & Fredrickson, 2011) conducted a prospective observational investigation of 339 adult participants in an eight-week long mindfulness-based stress and pain management program; we found that increases in dispositional mindfulness over the course of mindfulness training correlated with increases in positive reappraisal, and that the stress-reductive effects of increases in dispositional mindfulness were partially mediated by increases in positive reappraisal (Garland et al., 2011). A quasi-experimental study comparing college students participating in a mindful communication course to those receiving a standard communications curriculum found that mindfulness training was associated with significant increases in dispositional mindfulness which were correlated with increases in positive reappraisal (Huston, Garland, & Farb, 2011). In another student sample, brief mindfulness training was also shown to significantly increase positive reappraisal relative to a non-randomized comparison group (Jones & Hansen, 2015). A study of college students facing examination stress found that mindfulness significantly predicted increased tendency to appraise the exam as a challenge rather than a threat (Weinstein, Brown, & Ryan, 2009). Similarly, positive reappraisal mediated the inverse association between trait mindfulness and burnout (Gerzina & Porfeli, 2012). Among cancer patients participating in MBSR versus a waitlist control group, MBSR participants demonstrated significantly increased post-traumatic growth which was mediated by increases in mindfulness skills (Labelle, Lawlor-Savage, Campbell, Faris, & Carlson, 2014). Another observational study of breast cancer patients participating in MBSR found a correlation between increases in dispositional mindfulness and increases in the sense of coherence (i.e., the ability to derive a sense of meaning from life experience, a construct conceptually related to positive reappraisal, see Antonovsky, 1993) occasioned by participation in the course (Matousek & Dobkin, 2010). Similarly, breast and gynecologic cancer patients receiving MBCT evidenced significant increases in post-traumatic growth that were correlated with increases in dispositional mindfulness (Stafford, Foley, Judd, Gibson, Kiropoulos, & Couper, 2013).

Findings from several laboratory-based investigations are also consistent with our hypothesis. An investigation employing fMRI identified a significant association between trait mindfulness and dorsomedial prefrontal cortex activation during a reappraisal task which was inversely correlated with amygdala reactivity to negative stimuli (Modinos, Ormel, & Aleman, 2010). A more recent study found that individuals who had completed a course of mindfulness training (MBCT) evidenced significantly greater positive reappraisal ability during experimental sad mood induction than a matched control group or those who had been treated with cognitive-behavior therapy (Troy, Shallcross, Davis, & Mauss, 2012). In an experimental study of brief mindfulness training, the degree of state mindfulness achieved during the act of mindfulness meditation was prospectively and positively associated with increases in reappraisal; path analysis revealed that the indirect effect between brief mindfulness training and reappraisal was significant through state mindfulness (Garland, Hanley, Farb, & Froeliger, 2014). Finally, long-term yoga meditation practitioners exhibited significantly more pronounced cardiac activation than control subjects during positive reappraisal trials on an affective image processing task, signifying greater engagement with the task (Pavlov, Reva, Loktev, Korenyok, Aftanas, 2015).

Lastly, longitudinal, randomized controlled trials indicate that mindfulness may promote reappraisal. In that regard, a randomized wait-list controlled trial of persons undergoing a month-long intensive mindfulness meditation retreat found that retreat participants had significantly greater increases in sense of meaning in life than waitlist control participants (Jacobs et al., 2011). These increases in meaning in turn mediated the effect of mindfulness on increases in telomerase, a biomarker linked with longevity. In a randomized trial involving early-stage breast cancer patients, participation in MBSR was associated with significantly greater increases in meaningfulness in the face of adversity (as measured by the Sense of Coherence Scale; Antonovsky, 1993) than participation in a usual care or health education control condition (Henderson, Clemow, Massion, Hurley, Druker, & Hebert, 2012). Lastly, a randomized controlled trial of Mindfulness-Oriented Recovery Enhancement (MORE), an intervention which explicitly teaches mindfulness skills as a means of enhancing reappraisal, indicated that chronic pain patients assigned to 8 weeks of MORE had significantly greater increases in positive reappraisal than those in a social support group (Garland, Manusov, Froeliger, Kelly, Williams, & Howard, 2014). Convergent findings across these diverse study designs, samples, and measurement approaches suggest the presence of a fundamental relation between mindfulness and positive reappraisal that reduces distress and supports psychological flourishing and health, providing support for the *Mindfulness-to-Meaning Theory*. And yet, more controlled experimental study is needed to fully validate and explicate the mechanisms of the mindfulness-to-meaning linkage. We suggest one additional mechanism, savoring, in the section below.

### Positive Reappraisal Begets Savoring of Pleasant Life Experience

The process of mindful positive emotion regulation does not end with the reframing of circumstances as benign, beneficial, or meaningful, but rather continues to unfold as attention is tuned in accordance with the novel mental set and positive meaning induced by the reappraisal. Indeed, holding a positive semantic frame will likely increase perception of other positive events, an assertion supported by an experiment conducted by Koivisto and Revonsuo (2007). The study demonstrated that semantic congruence between an observer's attentional set and unexpected stimuli determine whether those stimuli will be perceived: unexpected stimuli whose meaning is congruent with the current concerns of the observer are more likely seen, whereas unexpected stimuli incongruent with the semantic frame of the observer tend to go unnoticed. Thus, meaning modulates attentional selection and may determine whether a stimulus will even be perceived.

Given the influence of meaning on attentional selection, when an individual engages in positive reappraisal, he or she may begin to focus on and become aware of the beautiful, life-affirming, and rewarding elements of their current situation. In support of this contention, the ability to find positive meaning in adversity has been associated with the tendency to attend to positive information (Chan, Ho, Tedeschi, & Leung, 2011), and experiencing adversity in the past predicts savoring (Croft, Dunn, & Quoidback, 2013) - one of the most powerful means of amplifying positive emotion (Quoidback, Berry, Hansenne, & Mikolajczak, 2010). In that regard, selectively attending to positive stimuli is a form of positive emotion regulation (Wadlinger & Isaacowitz, 2010) that predicts increased levels of life satisfaction (Cavanagh, Urry, & Shin, 2011). Savoring involves not only attending to the

most perceptually salient features of an object or event, but also becoming aware of its more subtle features and emotional impacts, broadening the diversity and range of sensations and feelings to be derived from the experience (Bryant, Chadwick, & Kluwe, 2011). Thus, savoring involves metacognitive and self-reflective elements, where one focuses on both the pleasurable features of the stimulus as well as positive emotions that arise from encountering it (Frijda & Sundararajan, 2007). In these ways, savoring contains an element of mindfulness. By mindfully attending to the positive state that emerges from the encounter with the object, one can deepen and enrich the savored experience.<sup>2</sup>

Studies show that pleasant events actually outnumber unpleasant events by a 3-to-1 margin in everyday life (Oishi, Diener, Choi, Kim-Prieto, & Choi, 2007). Thus, pleasant experiences are plentiful, if people notice and appreciate them. Mindfully attending to the positive aspects of life experience (e.g., the sight of a beautiful sunset or the touch of a loved one's hand) may increase the perceived value of natural rewards, and thereby counter anhedonia, an insensitivity to pleasurable objects, events, and experiences that can result from chronic stress (Koob & Le Moal, 2001) or from simple habituation to routine events. In this regard, mindful savoring may amplify pleasure from perceptual and sensorimotor experience in a similar fashion to sensate-focus techniques (Masters & Johnson, 1970) and promote emotion regulation by generating positive attentional biases (Wadlinger & Isaacowitz, 2010). Such increased attention to sensory experience has been shown to elevate pleasure in eating and sex (Heiman & Meston, 1997; LeBel & Dubé, 2001), and attending to present-moment experience has been prospectively associated with happiness in large-scale, time-lagged analyses (Killingsworth & Gilbert, 2010).

As evidence of this hypothesis, an experimental mindful eating induction produced higher ratings of subsequent food liking (Hong, Lishner, Han, & Huss, 2011), and in a large study of 411 students, a mindful eating exercise led to higher levels of enjoyment in sampled food relative to nonmindful eating control condition (Hong, Lishner, & Han, 2014). Moreover, savoring through mindfulness may improve memory for positive experiences. In that regard, among healthy individuals, mindfulness training increased recall of positive word stimuli which was correlated with improvements in positive affect (Roberts-Wolf et al., 2012). Given these findings, it is plausible that learning to mindfully attend to and savor positive events may offset the negative affect and anhedonia characteristic of persons suffering from clinical disorders. In support of this hypothesis, a recent randomized controlled trial of MBCT with adults with residual depressive symptoms found that mindfulness training increased the experience of reward and positive emotion from pleasant daily life activities (Geschwind, Peeters, Drukker, van Os, & Wichers, 2011). Similarly, in a randomized controlled trial involving a sample of opioid misusing chronic pain patients, participation in Mindfulness-Oriented Recovery Enhancement led to enhanced parasympathetic responsiveness to natural rewards which statistically mediated the effect of the intervention on reductions in opioid craving (Garland, Froeliger, & Howard, 2014a). An analysis of event-related potential data from this study found that Mindfulness-Oriented Recovery

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<sup>2</sup>One concern in relation to mindful savoring is that this practice might lead to a 'clinging' to positive experience, resulting in suffering when the experience inevitably ends. A critic of our mindful reappraisal theory may argue that a focus on positive experience promotes attachment – a process eschewed by Buddhism. To address this concern, Wallace and Shapiro (2006) explain:

Enhancement significantly enhanced the late positive potential (LPP) of the EEG during visual processing of images representing natural rewards; increased LPP to reward cues was correlated with increases in positive affective response to the stimuli and decreases in craving (Garland, Froeliger, & Howard, 2014b). Thus, mindfulness may promote savoring of positive experiences, which in turn may enhance eudaimonic well-being.

According to the *Mindfulness-to-Meaning Theory*, the end result of the regulatory process linking mindfulness to reappraisal and savoring is not mere hedonic pleasure. Hedonic and eudaimonic well-being can reciprocally influence one another (King & Hicks, 2012). In that regard, positive affect predisposes individuals to find positive meaning (Fredrickson, Cohn, Coffey, Pek, & Finkel, 2008), and finding positive meaning enhances positive affect (Yamasaki, Uchida, & Katsuma, 2009). This reciprocal linkage between positive affect and cognition has been shown in autoregressive trajectory analyses to be propelled by mindfulness training into an upward spiral dynamic (Garland, Geschwind, Peeters, & Wichers, 2015). As such, mindfulness, reappraisal, and savoring may interact to infuse hedonic well-being with eudaimonia. This interaction emerges from the cultivation of self-reflexive awareness during a positive emotion regulatory process in which one savors and elaborates on the implications of the positive reappraisal, triggering networks of wider associations and meanings in the course of this temporally-extended phase of contemplation. In this way, the reappraisals that arise out of the state of mindfulness may become semantic attractors for novel positive experiences. Through this process, mindfulness connects daily life events with deeper meanings (eudaimonics), not by eschewing negative life experience and hedonics, but instead by situating adversity and hedonics into a deeper and more extensive meaning system. This meaning system is robust against positive and negative experiences in that it acknowledges the transitory and somewhat impersonal nature of all experience, which may facilitate reappraisal in difficult contexts and non-clinging forms of savoring in hedonic ones.

Such elaborative processing of positive reappraisals and their resultant emotions, when marked by the self-reflexivity of mindful savoring, may allow for the emergence of implicational meaning and the “felt sense” that gives an experience its affective flavor (Teasdale, 1993). Thus, through reappraisal and savoring, positive emotions may evolve into positive meanings and, ultimately, into ways of being that further reinforce tendencies to accentuate the positive and reappraise the negative. We propose that over time these propensities may consolidate into a sustainable, stimulus-independent, positive affectivity founded on a form of satisfaction that is “less a matter of getting what you want than wanting what you have” (Myers & Diener, 1995, p. 13). In this way, mindfulness promotes a self-reinforcing system of positive reappraisal and savoring – the expanding gyre of an upward spiral that broadens awareness and builds meaning toward the growth of individual flourishing and greater engagement with life.

## A Case Example of Mindfulness-to-Meaning in Action

The following case example (depicted schematically in Figure 3) from a patient of the first author (ELG) exemplifies principles of the *Mindfulness-to-Meaning Theory* in action. Consider the example of “Jacob,” a 63 year old man who was recently diagnosed and treated

for a potentially life threatening cancer. During the treatment process he had received mindfulness training in three prior individual therapy sessions at the cancer hospital, where he had been taught to engage in mindful breathing meditation by the first author (for a script of the meditation instructions, see Garland, Hanley, Farb, & Froeliger, 2015); Jacob had dutifully practiced this meditation for 15 minutes every other day for the past several weeks. After completing a grueling series of surgeries followed by a series of chemotherapy and radiation treatments, one morning Jacob found himself overwhelmed by thoughts of his impending doom. He began to engage in mindfulness meditation, as he had been trained to do, and subsequently was able to gain awareness of, acknowledge, and subsequently accept the presence of these thoughts without suppression. After mindfully decentering from the stress appraisal “My life is over – I’m doomed,” he began to metacognitively observe feelings of a great despair coupled with intense sensations of heaviness in his chest and a gnawing emptiness in his gut. Again, Jacob returned the focus of his attention back to his breath to decenter from this negative emotional state, allowing him to again adopt a metacognitive perspective of his own experience, which he sustained for several moments until he found his attention automatically captured by the fresh scars on his belly where his cancer had been surgically removed. Becoming aware of the constriction of his attention, Jacob was again able to engage in mindful breathing as a means of decentering into the mode of metacognitive awareness, which allowed his attention to broaden to encompass both the sensation of his breath as well as the beautiful view out his window to the snowcapped mountains beyond. Attending to these facts of his present survival, out of which emerged the positive reappraisal “I’m lucky to be alive” and emotions of relief and contentment.

Several minutes later as Jacob was filing bills from the hospital, he experienced distress with the thought “What if I have a recurrence?” He again began to practice mindfulness, and then became aware of embodied feelings of fear. Acknowledging these emotions and returning to the breath, Jacob decentered from thoughts of cancer recurrence back into a state of metacognitive awareness, from which he could watch the fearful thoughts and feelings dissipate “like clouds dissolving into mist” and be gradually replaced by equanimity, out of which arose a positive, buoyant state as his attention broadened to the photograph of his grandchildren on his fireplace mantle. Admiring the image of their smiling faces, he made another positive reappraisal, realizing “Cancer or no cancer, I still have so much I want to share with them.” Consequently, his attention broadened further to encompass other positive aspects of his past and present life circumstances, including his long marriage to a loving partner, achieving significant professional accomplishments, and engaging in activities that he loved. As Jacob began to savor the positive emotions arising during these moments of contemplation, he came to the recognition that “cancer has strengthened my gratitude muscle.” This reappraisal then matured into sentiments of deep gratitude and joy coupled with the impulse to spend more time and energy devoted to his family – which enhanced his sense of meaningfulness and purpose in life.

The foregoing example depicts the nonlinear trajectory of the mindful positive emotion regulation process. Individuals may have to recurrently oscillate between mindfully disengaging from negative appraisals and generating reappraisals before attaining a sense of well-being; indeed multiple iterations of decentering are often needed to engender attention

to novel information from which positive reappraisals may be constructed to stimulate savoring and eudaimonic meaning. The iterative re-processing that occurs during this cycle may afford greater depth of insight and broader associations to be built, thereby producing more durable positive affective consequences over longer timescales. Yet, the time course from stress appraisal to mindfulness to eudaimonic meaning is currently unknown. Does mindful reappraisal and savoring unfold over seconds, minutes, hours, days, or weeks? How many repetitions of decentering are needed before a given thought content can be reappraised? What duration of metacognitive awareness is necessary to engender broadened attention to novel contextual information from which reappraisals may be constructed? How do momentary reappraisals during a single episode of mindful emotion regulation quantitatively and qualitatively differ from eudaimonic insights that emerge over time across emotion regulatory episodes? Future empirical studies employing fine-grained experience sampling are needed to elucidate the temporal dynamics of these phenomena.

### **Traditional Accounts of Mindfulness as Generative of Insight and Positive Mental States**

The *Mindfulness-to-Meaning Theory* we have proposed is counter to the views of some contemporary psychological scientists, who assert that mindfulness is antithetical to reappraisal due to its purportedly nonjudgmental or non-conceptual approach to affective experience (Brewer, Elwafi, & Davis, 2012; Chambers, Gullone, & Allen, 2009). In contrast, traditional Buddhist definitions of mindfulness posit that the practice of stabilizing attention and calming the mind (or *shamatha* in Sanskrit) is a key step towards the development of cognitive insight (*vipassana*) into the nature of the self and world (Bodhi, 2011). Thus, as some contemplative scholars have recently articulated, traditional Buddhist perspectives prescribe more than an attentional practice - they also emphasize the importance of an evaluative process intended to generate *samprajñāna* or “clear comprehension” of phenomenological experience, leading to particular insights into the nature of self and world (Dreyfus, 2011). By using mindfulness to stabilize attention, clear comprehension becomes possible, and therefore allows one to reframe the meaning of life experiences. Thus, through mindfulness “When we are able to remain carefully in touch with our experiences and comprehend them as being impermanent, we are able to change their meaningfulness so as to see them in a different light” (Dreyfus, 2011, p. 51).

Given the prioritization of certain insights and ethical modes of conduct, mindfulness across Buddhist perspectives is by no means a nonjudgmental process - instead, intense study instills belief in the value of meditation as a means of liberating oneself from self-inflicted suffering, and also from the egoism that limits our ability to help others along this path (Bodhi, 2011). Although nonjudgment is integral to mindfulness practice, as self-deprecating judgments following mind-wandering are likely counter-productive, this equanimity towards transient failures in attention is tempered by a broader scrutiny of one’s practice and ensuing thoughts, speech and action that is integral to the project of self-transformation. Thus, the experiential content of meditation becomes a target of evaluation as a means of revealing metaphysical truths of phenomenological impermanence and the illusory nature of the self. With such revelatory goals, meditation becomes a practice that

integrates culturally-derived ideals, allowing for a much greater impact on personal attitudes and actions. Within this process, personal meaning is generated regarding one's own trajectory on a spiritual path towards self-actualization.

As such, traditional mindfulness practices were never intended to operate within a vacuum of dispassionate observation in the absence of eudaimonic goals. To the contrary, Buddhism clearly and strongly endorses “the cultivation of happiness, the genuine inner transformation by deliberately selecting and focusing on positive mental states” (Dalai Lama & Cutler, 1998, pp. 44–45). In Buddhism, mindfulness is but one aspect of a broader Eightfold Path, designed to transform destructive thoughts and behaviors into virtuous ones, and promoting joy and equanimity (Rahula, 1959). Among the factors of the Eightfold Path, Right Effort (*sammappadhana*) is defined as the will to prevent and remove negative states of mind, and to generate and sustain positive mental states (Rahula, 1959). Thus, mindfulness practice was originally intended to strengthen mental capacities in the service of disrupting negative states and cultivating positive psychological processes rather than sustain an affectively neutral state.

To be clear, there is no isomorphism between the positive aspirations endorsed by the Buddhist ideal and the practitioner's current emotional state – the positive aspirations of Buddhism do not imply that a practitioner's mind states are ideally positive. Indeed, a compassion meditation on the suffering of others may yield intense feelings of sadness, pain, and angst as the implicational meaning of suffering is first intuited and later consciously contemplated. These painful “negative” emotions may in turn be a prerequisite for subsequent positive emotions and actions that arise from a feeling of interconnectedness with others. Thus, the ethical and altruistic commitments undertaken by Buddhist practitioners do not necessarily correspond to positive affective states in a one-to-one manner. To the contrary, negative affective states can serve to catalyze the motivation to be of benefit to those who suffer. Yet, as described above, Right Effort is aimed at transforming negative mental states into beneficent states of mind and actions designed to liberate self and others from suffering (Bodhi, 2011).

One such practice found in Tibetan Buddhism is known as *duk ngal lam du drub pa*, a *lo jong* (i.e., mind training) practice translated as “transforming adversity into the path of awakening” (Wallace, 2003). During this practice, when difficult circumstances arise,

If we can shift our focus from our rigid, narrow, and habituated points of view, we will empower our ability to embrace situations in a new way ... We should endeavor to think good thoughts about people who have in fact made our lives quite difficult at times and try to turn these negative situations into our own spiritual advantage... Every time we overcome an obstacle or an adversity, we become that much more intelligent and resilient

(Kyabgon, 2007, p. 96–97).

This meditative teaching of re-envisioning adversity as an opportunity for spiritual practice contains an element of positive reappraisal, exemplified in this aphorism by the 8th century Indian Madhyamaka Buddhist scholar Shantideva, “So like a treasure found at home, enriching me without fatigue, all enemies are helpers in my bodhisattva work, and therefore

they should be a joy to me” (cited in Kyabgon, 2007, p. 97). According to this view, *enemies* are to be re-constructed as *helpers* – a cognitive process in which one reappraises an adversary or malign force as a helper who provides the opportunity to exercise compassion. In addition to positive reappraisal, this teaching also involves positive mental qualities like equanimity, tenacity, and compassion, as well as deep understanding of the interdependence between self and others.

Such classic texts suggest that Buddhist scholars did not believe that mindfulness practice alone was sufficient for the alleviation of suffering. Instead, mindfulness was seen as facilitative of other forms of mental training (such as those centered on intentional positive reappraisal) designed to modify cognitive processes underlying self-centeredness and generate eudaimonic well-being (Wallace, 2003). Thus, the observational function of mindfulness allows for clear comprehension, leading to insight and benevolence (Bodhi, 2011). According to Dreyfus (2011), mindfulness engenders “changes in the focus of attention [that] lead to changes in cognitive content, something entirely obvious that seems, however, to be lost in the rush to identify mindfulness with present-centered non-judgmental awareness” (p. 52). Although this notion is integral to traditional Buddhist conceptualizations of mindfulness, the modern psychological literature has failed to specify temporally-dynamic, causal models that explain how mindfulness training changes cognitive content to promote eudaimonic well-being. The *Mindfulness-to-Meaning Theory* is intended to fill this lacuna in the literature and further the next generation of research into the downstream effects of mindfulness training on higher-order cognitive-affective processes integral to meaning making and human flourishing.

## Conclusion

The *Mindfulness-to-Meaning Theory* raises an apparent paradox: mindfulness encourages non-evaluative contact with phenomenological experience and attenuates emotional distortions of the perceptual process, whereas positive reappraisal attributes a positively-valenced, semantic meaning to experience. Striving to re-construct situations as positive would seem to be contrary to the ethic and quality of mindfulness. In addition, the semantic elaboration and emphasis on meaning involved in positive reappraisal may be seen in stark contrast to the non-conceptual state that is the pinnacle of mindfulness practice. On the other hand, there is a long tradition of using mindfulness as a means of gaining insight and wisdom (Bodhi, 2011; Dreyfus, 2011).

A broader temporal perspective is needed to resolve this paradox. Although *mindfulness is not reappraisal*, we contend that mindfulness and reappraisal are not contradictory psychological operations, but rather represent distinct and complementary stages of a positive emotion regulation process that unfolds over time. This process has yet to fully specified; existing longitudinal research on the consequences of mindfulness training has been modest in scope, perhaps driven by the exigencies of academic research and grant funding cycles. To estimate longitudinal effects, cross-sectional designs comparing expert meditators to novices or age-matched controls have been employed; but in looking at the relatively ‘finished product’ of an expert meditator, these cross-sectional designs lack the ability to determine the temporal order of emergent mindful attention, contemplative values

such as equanimity and compassion, and shifts in meaning around the self, the world, and one's role within it. Our current model descriptions are thus necessarily limited, as we are not able to fully delineate the inevitable complexities that arrive in negotiating radical transformations of eudaimonic meaning. We cannot make strong hypotheses about the necessary dose of mindfulness training needed to realize new meanings, nor describe what sorts of adversity may promote or hinder the positive reappraisal process, nor even whether there are some forms of reappraisal that are ultimately more adaptive than others. In seeking to answer these questions, future research may blaze new trails into the undiscovered country spanning mindfulness to meaning, guided by the theoretical map we have proffered.

To reiterate, the *Mindfulness-to-Meaning Theory* asserts that mindfulness facilitates positive reappraisal in that it evokes a decentered mode of awareness in which thoughts and emotions are viewed from a metacognitive perspective - allowing for the flexible construction of more adaptive appraisals. By mindfully accepting experiences instead of perseverating on them, cognitive resources are freed up to broaden the scope of attention to encompass pleasurable and meaningful events and thereby build motivation toward purposeful engagement with life.

Thus, mindfulness aids in undoing the linkage between the initial cognitive appraisal and the conditioned responses that typically follow from it. By facilitating decentering, the initial appraisal loses its power to elicit a behavioral reaction, as mindfulness opens a space in which the individual witnesses distressing thoughts and emotions as merely transient events - not immutable truths or determinants of action. It is in this space that new appraisals of self and world can be made to further eudaimonic well-being. As such, acceptance of experience through mindfulness may be a key mechanism that underlies the therapeutic efficacy of reappraisal for promoting positive psychological outcomes. The aim of this therapeutic process is not to anesthetize the individual from difficult life experiences by regulating thoughts and emotions "away" with some Pollyanish delusion, but rather, to promote commitment to valued action and imbue life with a sense of purpose. Ultimately, mindfulness may be the fulcrum upon which reappraisals can be leveraged in service of living with the freedom, and therefore, the responsibility, for constructing a more meaningful and eudaimonic existence.

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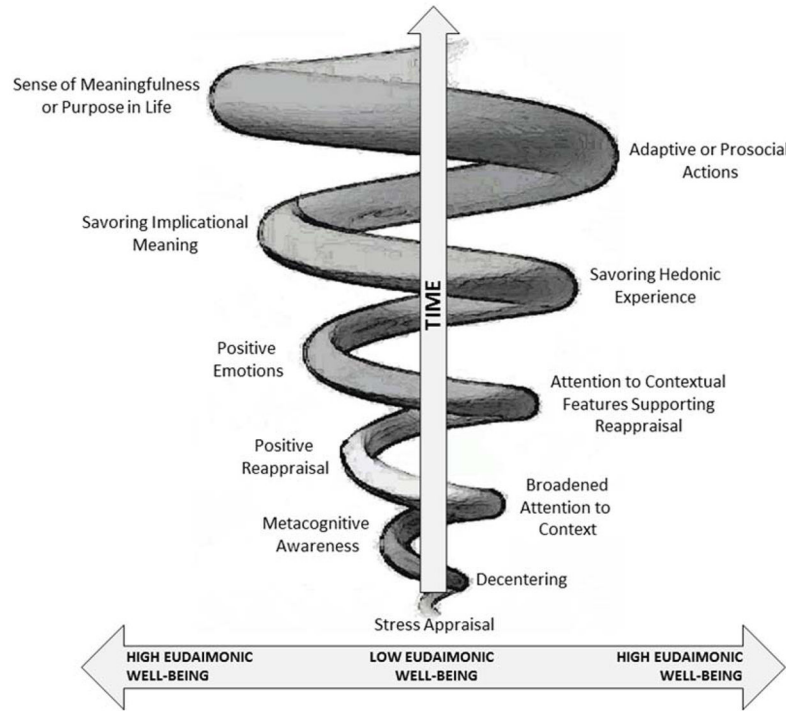
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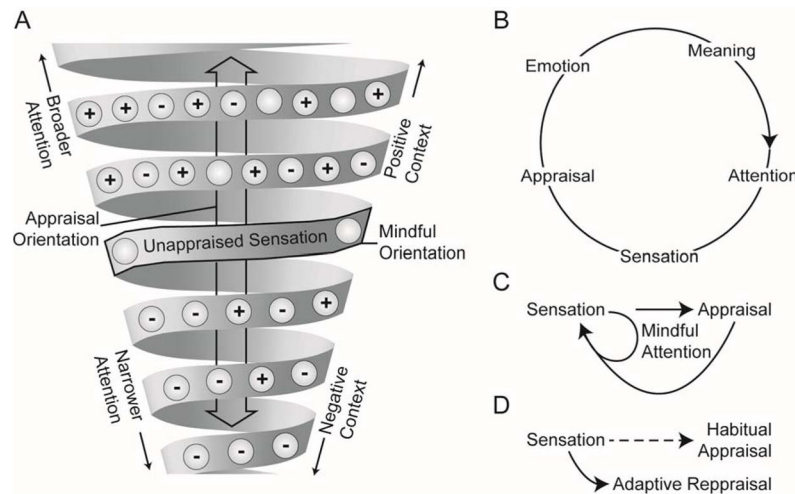
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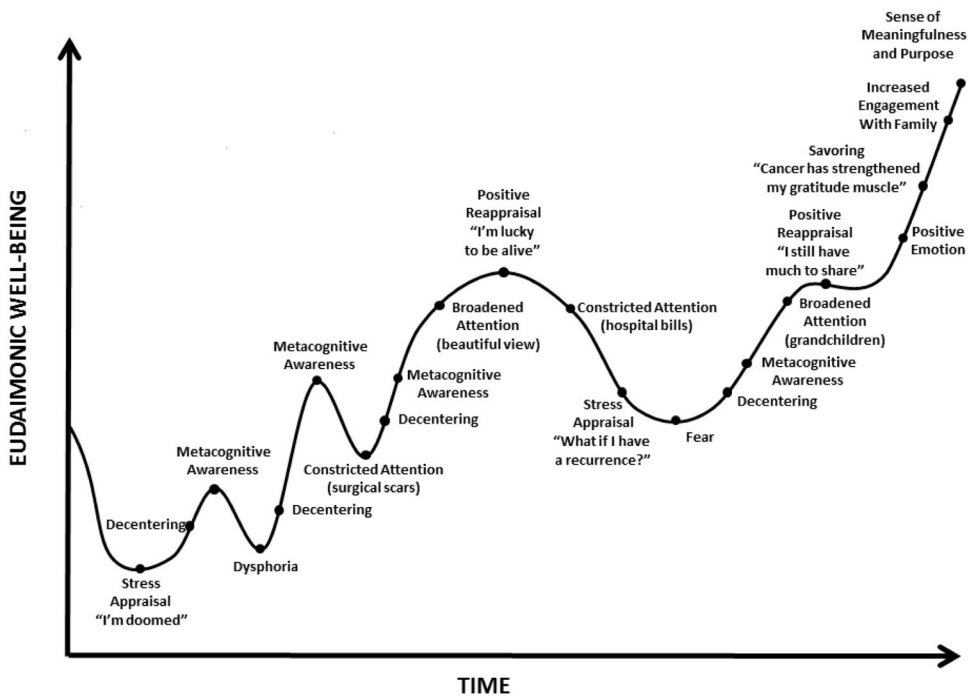


**Figure 1.** A graphical depiction of the *Mindfulness-to-Meaning Theory*: a process model of mindful positive emotion regulation. As this process unfolds over time, an increase in the width of the spiral denotes an increasing magnitude and depth of eudaimonic well-being. First, the practice of mindfulness meditation facilitates decentering from stress appraisals into the non-evaluative, metacognitive state of mindfulness, which deautomatizes habitual cognitive sets and induces positive affective tone, thereby broadening the scope of attention to encompass previously unattended contextual information. Positive tuning of the attentional system garners new data with which to formulate a positive reappraisal of the stressor, resulting in positive emotions which may then be savored to infuse eudaimonic, implicational meaning into hedonic processing of contextual features supporting the reappraisal. This cycle ultimately leads to productive reengagement with stressful life events, adaptive or prosocial action, and a sense of meaningfulness in life.



**Figure 2.**

Panel A: the emotional spiral; illustrating the distinction between mindful and appraisal orientations. The mindful orientation engages attention towards unappraised sensation, representing a neutral point along the spiral, whereas appraisal orientations serve to mobilize attentional and emotional resources, shifting emotional context either up or down the spiral. Bubbles with plus (+) or minus (-) signs represent positively and negatively appraised experiences, respectively. In the face of an unambiguously stressful life event, what varies is the number of other experiences (i.e., positive events and stimuli) available to awareness with which one may construct positive reappraisals to moderate the emotional context. The emotional context is the total set of appraisals that occupy working memory, which over time are ‘packaged’ into longer term memory as situational meanings. Panel B: the conventional appraisal orientation; each step in the cycle constrains and determines the following step, mutually constraining the deployment of attention and broader contextual meaning. Panel C: a schematic of the deployment of mindful attention; inhibiting the occurrence of appraisal and reorienting attention towards sensation when it is noticed that appraisal is occurring. Panel D: the consequence of the mindful orientation; a weakening of habitual appraisal and strengthening of more adaptive reappraisals of experience.



**Figure 3.** The *Mindfulness-to-Meaning Theory* in action, as exemplified by a case example from a cancer survivor. As the mindful positive emotion regulatory process unfolds over time, eudaimonic well-being fluctuates as a function of the engagement and disengagement of attentional, appraisal, and valuation mechanisms. Unlike the idealized schema depicted in Figure 1, progress towards eudaimonic meaning is non-linear and often involves multiple iterations of mindful decentering and reappraisal within and across emotion regulatory episodes before a sustainable positive trajectory of well-being can be achieved. Though future upsets and stress appraisals may result in temporary decreases in eudaimonic well-being, hypothetically in the case of a flourishing person the slope of the overall trend line increases as the individual builds self-regulatory skill and learns to construct a sense of meaning in the face of recurrent adversity.