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Loving-kindness and compassion meditation: Potential for psychological interventions☆

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ABSTRACT

Mindfulness-based meditation interventions have become increasingly popular in contemporary psychology. Other closely related meditation practices include loving-kindness meditation (LKM) and compassion meditation (CM), exercises oriented toward enhancing unconditional, positive emotional states of kindness and compassion. This article provides a review of the background, the techniques, and the empirical contemporary literature of LKM and CM. The literature suggests that LKM and CM are associated with an increase in positive affect and a decrease in negative affect. Preliminary findings from neuroendocrine studies indicate that CM may reduce stress-induced subjective distress and immune response. Neuroimaging studies suggest that LKM and CM may enhance activation of brain areas that are involved in emotional processing and empathy. Finally, preliminary intervention studies support application of these strategies in clinical populations. It is concluded that, when combined with empirically supported treatments, such as cognitive-behavioral therapy, LKM and CM may provide potentially useful strategies for targeting a variety of different psychological problems that involve interpersonal processes, such as depression, social anxiety, marital conflict, anger, and coping with the strains of long-term caregiving.

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Contents

Therapies derived from Buddhist practices, mindfulness-based therapy (MBT), such as mindfulness-based stress reduction (Kabat-Zinn, 1982) and mindfulness-based cognitive therapy (Segal, Williams, & Teasdale, 2002), have become a very popular subject in contemporary psychotherapy (for reviews, see Baer, 2003; Bishop, 2002; Hayes, 2004; Hofmann & Asmundson, 2008; Hofmann, Sawyer, Witt, & Oh, 2010; Kabat-Zinn, 1994, 2005; Roemer & Orsillo, 2009; Salmon, Lush, Jablonski, & Sephton, 2009; Siegel, 2007; Thera, 1962).

Mindfulness is a construct that is difficult to define (see Bishop et al., 2004; Grossman, 2008, in press; Kabat-Zinn, 2003; Melbourne Academic Mindfulness Interest Group, 2006). It has been described as a form of participant-observation that is characterized by moment-to-moment awareness of perceptible mental states and processes that include continuous, immediate awareness of physical sensations, perceptions,

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[1] The term *therapy* does not here imply that MBT is a treatment for an illness or disability. Instead, MBT teaches individuals to cope with universal aspects of being alive.

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affective states, thoughts, and imagery (Grossman, Niemann, Schmidt, & Walach, 2004). Definitions of mindfulness from Buddhism and MBTs focus upon a number of qualities that include (a) a deliberate intention to pay attention to momentary experience, (b) a marked distinction from normal, everyday modes of consciousness, (c) a clear focus on aspects of active investigation of moment-to-moment experience, (d) continuity of a precise, dispassionate, non-evaluative, and sustained moment-to-moment awareness of immediate experience, and (e) an attitude of openness, acceptance, kindness, curiosity and patience (see Grossman et al., 2004, 2010; Grossman & Van Dam, in press). Additionally, mindfulness directly involves active development of such qualities as energy, tranquility, and equanimity (e.g., Nanamoli & Bodhi, 2001, note 560). Along similar lines, if somewhat simplified, Bishop et al. (2004) distinguish two components of mindfulness: one that involves self-regulation of attention and one that involves an orientation toward the present moment characterized by curiosity, openness, and acceptance.

Mindfulness meditation employs the full range of perceptible experience as possible objects of mindful awareness, for example, bodily or other sensory experience, affective states, thoughts, or images. Illustrative of this approach and often seen as a particularly useful technique is the mindfulness practice of moment-to-moment attending to breathing. The aims of breath awareness within the Buddhist perspective are (among others): (1) to use an observable, easily perceptible and constantly available physical stimulus (the breath) as object of investigation of mind-body awareness; (2) to utilize continuous attention to the breath to improve the capability of moment-to-moment volition-driven concentration; (3) and to employ a rather simple object of observation (which is intimately related to physical mental and emotional functioning) as a starting point for more complex objects of awareness. It should be noted, however, that mindfulness of breathing in itself is a sophisticated, systematic, and multilayered procedure (for further details, see Grossman, 2010, in press; Rosenberg, 2004). Thus, consistent with definition of mindfulness above, a major aim of mindfulness meditation is to raise awareness of the present moment by means of a process of phenomenological investigation that is inherent to mindfulness practice. MBT has been typically derived from non-Tibetan traditions and practices, particularly the Theravadin tradition (the oldest existing Buddhist school), although mindfulness is also central to other Buddhist traditions as well.

A recent review of the literature suggests that MBT is a beneficial intervention to reduce negative psychological states, such as stress, anxiety, and depression (Hofmann et al., 2010). This review identified 39 studies totaling 1140 participants receiving MBT for a range of conditions, including cancer, generalized anxiety disorder, depression, and other psychiatric or medical conditions. Effect size estimates suggest that MBT is associated with strong effects for improving anxiety and mood symptoms in patients with anxiety and mood disorders. In other patients, this intervention was moderately effective for improving anxiety and mood symptoms. These effect sizes were robust and unrelated to number of treatment sessions or publication year. Moreover, the treatment effects were maintained over follow-up. These findings suggest that MBT is a promising intervention for treating anxiety and mood problems in clinical populations.

However, most studies of mindfulness pertain to a certain aspect of Buddhist meditation practice, namely, attending to mental content, such as current feelings, or sensorial experiencing, such as the breath, in a nonjudgmental, curious manner (for discussions of mindfulness see Bishop et al., 2004; Grossman, 2008, in press; Kabat-Zinn, 2003; Melbourne Academic Mindfulness Interest Group, 2006). In the Buddhist tradition, there are other very prominent practices that involve other attentional objects and emotional modes of attending to those objects that have been much less discussed, namely loving-kindness and compassion meditation. These practices have only recently been investigated by contemporary psychology researchers.

Loving-kindness meditation (LKM) aims to develop an affective state of unconditional kindness to all people. Compassion mediation (CM) involves techniques to cultivate compassion, or deep, genuine sympathy for those stricken by misfortune, together with an earnest wish to ease this suffering (Grossman & Van Dam, in press; Hopkins, 2001). Both forms of meditation (LKM and CM) are centrally related to, and include the practice of, mindfulness, as noted by many scholars and practitioners from varying traditions, including Theravadin, Japanese, and Chinese Zen (e.g., Bodhi, 2005; Kuan, 2008; Sanharakshita, 2004; Sheng-Yen, 2001; Suzuki, 2011).

LKM has been described by Salzberg (1995) as a path of deep spiritual transformation. She wrote:

> The path begins with cultivating appreciation of our oneness with others through generosity, nonharming, right speech, and right action. Then, on the foundation of these qualities, we purify our minds through the concentration practices of meditation. As we do, we come to experience wisdom through recognizing the truth, and become deeply aware of the suffering caused by separation and of the happiness of knowing our connection with all beings (p. 6).

Similarly, compassion has been described as a path leading to greater awareness. For example, Feldman (2005) wrote:

> One is to see compassion as the outcome of a path that can be cultivated and developed. You do not in reality cultivate compassion, but you can cultivate, through investigation, the qualities that incline your heart toward compassion. You can learn to attend to the moments when you close and contract in the face of suffering, anger, fear, or alienation. In those moments you are asked to question what difference empathy, forgiveness, patience, and tolerance would make. You cultivate your commitment to turn toward your responses of aversion, anger, or intolerance. With mindfulness and investigation, you find in your heart the generosity and understanding that allow you to open rather than close. (pp. 141–142).

The goal of this review is to provide a brief historical background, explain the therapeutic procedures, review the experimental and intervention research literature, and discuss the relevance of LKM and CM as adjunctive components of contemporary psychosocial treatments.

1. Background

Loving-kindness, also known as *metta* (in Pali), is derived from Buddhism and refers to a mental state of unselfish and unconditional kindness to all beings. Similarly, compassion (*karunaa*) can be defined as an emotion that elicits "the heartfelt wish that sentient beings be free from suffering and the causes of suffering" (Hopkins, 2001). Compassion can be likened to the feeling a loving mother has toward alleviating the suffering of her child in distress but is aimed at all beings (The Dalai Lama, 2001). Loving-kindness and compassion are closely linked to the Buddhist notion that all living beings are inextricably connected. Together with loving-kindness (*metta*) and compassion (*karuna*), sympathatic joy (*mutida*; i.e., joy in the others joy, the opposite of Schadenfreude), and equanimity (*upekkha*; being calm and even-tempered) constitute the four *brahma viharas*, which are regarded as four sublime states (also known as noble and divine abodes or "immeasurables") that can be cultivated, as described in the *Visuddhimagga,* an influential Buddhist text ("Path of Purification"; Buddhaghosa, 1975).

These four attitudinal qualities, or emotions, form the foundation of the Buddhist ethical system. However, they are not seen as dictates from a higher authority but rather as characteristics necessary to

achieve insight into the workings of our own minds, as well as the world around us, to attain a life free from misery. According to this view, in order to effectively pay moment-to-moment attention to the perceptible (an inherently cognitive act), one needs to cultivate these four qualities. Without their presence, whenever confronted by unpleasant or negative perceptions (e.g., negative self-thoughts, disturbing emotions, or distressing images), one would be highly likely to come into an evaluative or ruminative state of mind and thus no longer be able to imagine or actually experience the emotional state as an object of attention and mindful awareness. Only when we are able to confront difficult sensations emotions or thoughts with a degree of kindness, compassion, and composure, can we attend to the variety and textures of present-moment experiences in a mindful way. Consequently, the four immeasurables, including loving-kindness and compassion, can be seen as attributes that underlie the nonjudgmental aspect of mindful awareness. Without them, negative judgments interfere with sustained mindfulness, whether to the breath or to any other object of awareness.

In Buddhist psychology, these four qualities are seen as particularly important for human development, especially for parents (Kraus & Sears, 2009). In many Buddhist countries (e.g., Cambodia and Thailand), a four-faced Brahma image is popular and is thought to represent these four virtues; often this image is placed next to a Buddha image in temples (for a further discussion, see Nickerson & Hinton, 2011).

2. Compassion and loving-kindness meditation techniques

Whereas other types of mindfulness meditation encourage nonjudgmental awareness of experiences in the present moment by focusing on bodily or other sensorial experience, affective states, thoughts, or images, CM focuses awareness upon alleviation of the suffering of all beings, and LKM upon loving and kind concern for their well-being. These exercises each can be practiced at any time and in different postures—e.g., while sitting or lying—and even while walking (Buddharakkhita, 1995; The Dalai Lama, 2001). The practices can be quite simple in their rudimentary forms, consisting of directing these feelings towards oneself, toward specific others or in all directions to all beings.

In many Buddhist practices, LKM and CM are combined together, and such is the case in most psychological studies (e.g., Kabat-Zinn, 1990; Lutz, Greischar, Perlman, & Davidson, 2009). In the elaborated form of compassion meditation, the meditator conducts a series of contemplations. According to Buddhist tradition (Book 1, *uraga vagga* [the snake book], *cunda kammaraputta sutta* [AN 10.176], at each stage the meditation exercise consists of thinking about specific wishes (aspirations) for the other, including the following: (1) may the person be free from enmity; (2) may the person be free from mental suffering; (3) may the person be free from physical suffering; and (4) may the person take care of him/herself happily (see e.g., Chalmers, 2007; The Dalai Lama, 2001). One may begin by first directing this feeling of compassion towards oneself or to others, depending upon what is easiest.

During LKM, the person typically proceeds through a number of stages that differ in the focus of the LKM exercise and also proceeds from easier to more challenging types of contemplation. These include : (1) focus on self; (2) focus on a good friend (i.e., a person who is still alive and who does not invoke sexual desires); (3) focus on a neutral person (i.e., a person who typically does not elicit either particularly positive or negative feelings but who is commonly encountered during a normal day); (4) focus on a "difficult" person (i.e., a person who is typically associated with negative feelings); (5) focus on the self, good friend, neutral person, and difficult person (with attention being equally divided between them); and eventually (6) focus on the entire universe (Buddharakkhita, 1995; The Dalai Lama, 2001). As can be seen from this sequence, typically warm feelings are initially directed toward oneself and then extended to an ever-widening circle of others, ultimately radiating them in all directions (north, south, east, west, and so on), although the order can be changed to accommodate individual preferences.

Each practice, whether LKM or CM, represents an exercise that employs the imagining or actual experience of the emotional state as an object of attention and mindful awareness. The practices should not be seen as mere mechanical repetitions of images or phrases. Rather, by mindfully investigating what occurs when one attempts to generate loving-kindness or compassion, it is presumed that insight is gained into the nature of these emotions themselves, as well as one's personal relationships to them. Also by turning toward this focus of experience in a kind, open, patient and tolerant manner, a shift in these affective states toward greater loving-kindness and compassion is thought to take place.

These meditation exercises are believed to broaden attention, enhance positive emotions, and lessen negative emotional states; they are seen to shift a person's basic view of the self in relation to others and increase empathy and compassion (The Dalai Lama & Cutler, 1998). Within traditional Buddhist practice, LKM is considered particularly helpful for people who have strong tendency toward hostility or anger (e.g. Analayo, 2003; Sheng-Yen, 2001).

3. Effect on emotional response

A study by Hutcherson, Seppala, and Gross (2008) recruited 93 participants and randomized subjects to receive either an exercise adapted from LKM ($n = 45$) or an imagery condition ($n = 48$). Participants in the LKM condition were instructed to imagine two loved ones standing to either side of the participant and sending their love. After 4 min, subjects were told to open their eyes and redirect these feelings of love toward the photograph of a stranger with a neutral emotional expression, appearing in the center of a computer screen. Participants were asked to repeat a series of phrases designed to bring attention to the other, and to wish them health, happiness, and well-being. Subjects in the imagery condition were instructed to imagine two acquaintances that they did not know very well and for whom they did not have strong feelings standing to either side of them. Participants were then instructed to focus on each acquaintance's physical appearance. After 4 min, the participants were told to open their eyes, look at a photograph of a neutral stranger, focus their attention on the visual details of the stranger's face and imagine details of the stranger's appearance. Instructions of both conditions lasted for about 7 min. The dependent variables included ratings of positive and negative mood and participants' explicit and implicit evaluative responses to 6 photographs (picture of participant, a close other, three neutral strangers, and a lamp) before and after the visualization (LKM or imagery) directed toward a photograph of one of the neutral strangers (target). For each picture, participants indicated how connected, similar, and positive they felt toward the subject on a 7-point Likert scale. To assess implicit responses to each picture, an affective priming task was used (Fazio, Sanbonmatsu, Powell, & Kardes, 1986) with one of the photographs as a prime, followed by positive or negative words. Participants were instructed to judge as quickly and accurately as possible whether the word was positive or negative. Implicit evaluations were determined by taking the difference between the average response time to positive and negative words following a particular prime. An implicit positive response manifests as a bias to respond faster to positive words, and slower to negative words, after the prime. The results revealed a significantly greater effect of LKM on both explicit and implicit positivity toward neutral strangers relative to imagery. LKM was associated with greater positive affect toward its target, as well as toward nontarget neutral strangers. For the implicit measure, however, the effect of meditation was only evident for its target, with little or no impact on responses toward strangers. LKM was also associated with greater implicit positivity toward the self. These findings suggest that even a brief

(7 min) exercise of LKM was sufficient to induce changes of small to moderate effect size.

A study by Fredrickson, Cohn, Coffey, Pek, and Finkel (2008) investigated the question of whether a modified LKM intervention enhances a person's daily experiences of positive emotions, which, in turn, may increase personal resources that hold positive consequences for the person's mental health. The study was conducted at a large business software and information technology services company. Employees who agreed to participate in this study were assigned to receive LKM ($n = 102$) or were assigned to a waitlist control group ($n = 100$). The study involved daily assessments of time spent meditating and a range of measures to assess positive and negative emotions. The intervention consisted of six 60-minute group sessions conducted over 7 weeks with 20–30 participants and 1 instructor per group. In the first session, participants received a CD with three recorded guided meditations. In Week 1, participants practiced a meditation directing love and compassion toward themselves. During subsequent weeks, the objects of LKM built from self, to loved ones, to acquaintances, to strangers, and to all living beings. The LKM periods were between 15 and 20 min in duration and were conducted in groups. Each session also included a 20-minute discussion to examine participants' progress and answer questions, and 20 min for a didactic presentation about features of the meditation and how to integrate concepts from the workshop into one's daily life. Participants were asked to practice LKM at home, with the guided recordings, at least 5 days per week. The results showed that LKM led to shifts in people's daily experiences of a wide range of positive emotions, including love, joy, contentment, gratitude, pride, hope, interest, amusement, and awe. These increases in positive emotions could be observed both within the trajectories of change in daily emotions over the span of 9 weeks and also 2 weeks after formal training ended. These shifts in positive emotions were relatively small in magnitude. However, over the course of 9 weeks, they were associated with increases in a variety of personal resources, including mindful attention, self-acceptance, positive relations with others, and good physical health. Furthermore, the gains in personal resources led participants to become more satisfied with their lives and to experience fewer depressive symptoms. Interestingly, the effects of LKM were specific to positive emotions, because negative emotions did not show any substantial changes. In contrast, an earlier study by Carson et al. (2005) showed that LKM was also associated with a decrease in trait anger, anxiety, and distress. Carson et al. (2005) compared an 8-week LKM program ($n = 18$) with standard care ($n = 25$) for chronic low back pain. Dependent measures included the participants' reported pain, anger, and distress. LKM initially involved patients recalling a time when they felt a very positive feeling of connection with a loved one, letting go of the content of this memory while remaining focused on the actual feelings of love and kindness elicited in the present moment by the memory, and employing silent mental phrases to direct these positive feelings, as best as possible, toward the loved one (i.e., may this person be at ease/content/happy/safe and secure) and then toward oneself. During the final minutes of the meditation, patients were asked to rest with attention to any feeling of love that remained from the practice. Note that the focus on affect is somewhat different from the cognitive focus that is more typical of other loving-kindness practices (e.g., Salzberg, 1995).

Over the course of several weeks, this exercise was gradually extended to include directing positive feelings toward a neutral person (e.g., postman, store clerk); toward a person who harmed the patient or was a source of difficulty for them in the past in some way, and who they felt they could forgive to some extent (e.g., disrespectful former boss); and then toward all living beings. Along with the in-session practices of loving-kindness meditation, the protocol included psychoeducation, group discussions, and additional practices, such as body scan exercise that encourages patients to accept their bodies and to feel gratitude for what their bodies have enabled them to accomplish in life. As part of the homework assignments, patients were asked to spend 10 to 30 min daily practicing audiotape-guided loving-kindness strategies on their own.

Results from this small randomized pilot trial indicated that LKM reduced pain, anger, and psychological distress to a greater degree than standard care at post-test and follow-up. Multilevel analyses of daily recordings further showed that more LKM practices were related to less pain that day and less anger the following day. However, it should be noted that LKM may have led to a greater reduction in negative emotions as compared to other studies because participants might have had higher negative emotions at baseline. Future, well-controlled, studies would provide valuable information about the therapeutic effects of LKM.

In addition to studies examining the potential clinical utility of LKM, a number of authors have recently begun to examine self-directed compassion. Self-directed self-compassion refers to the compassion about one's own suffering. The state of self-compassion involves generating the desire to alleviate one's suffering, healing oneself with kindness, recognizing one's shared humanity, and being mindful when considering negative aspects of oneself (Neff, 2003; Neff & Vonk, 2009; Thompson & Waltz, 2008). Leary, Tate, Adams, Allen, and Hancock(2007) conducted a number of studies with undergraduate student populations by using a self-report instrument to measure self-compassion as a trait variable. These studies suggest that self-compassion moderates reactions to distressing events involving failure, rejection, and embarrassment. Specifically, Leary et al. (2007) observed that individuals with high levels of self-compassion reported less negative emotion when confronting real, imagined, or remembered negative events, were more willing to accept responsibility for negative events, but were less likely to ruminate about unpleasant events compared to individuals low in self-compassion.

Mindfulness-based interventions, by themselves, may also serve as forms of compassion training as suggested by Kuyken et al. (2010). The authors provided evidence that mindfulness-based cognitive therapy, even without explicit CM training, enhanced self-compassion among patients with major depression in remission. Furthermore, changes in self-compassion appear to mediate benefits in depressive symptoms. These effects may result from applying just those affective qualities of kindness and acceptance—inherent to LKM and CM—to challenging momentary states. Concentrative and self-investigative skills, a quiet mind and self-compassion may conceivably be necessary prerequisites for the cultivation of compassion to others. This may also account for the fact that mindfulness meditation is typically first learned before LKM and CM are practiced (e.g., Kabat-Zinn, 1990).

4. Neuroendocrine effects

Two recent studies examined whether a Tibetan program of CM moderates the effect of stress on immune and neuroendocrine responses (Pace et al., 2009, 2010). The study by Pace et al. (2009) randomized healthy adults to 6 weeks of CM training ($n = 33$) or health discussions as a control condition ($n = 28$). Dependent measures included plasma cortisol, plasma concentration of interleukin-6, and subjective anxiety response to a social stress test that involves a social performance task. The groups showed no difference in plasma cortisol or interleukin-6 concentration. However, increased meditation practice was associated with decreased stress-induced interleukin-6 and subjective reports of distress in the meditation group. These results suggest that CM reduces stress-induced subjective distress and immune response. However, a major limitation of this study was that the stress test was administered after, rather than before, CM training. Therefore, it is possible that associations between CM practice time and outcome in the stress task might have been due to differences in participants' stress response rather than due to the practice itself, because participants with reduced stress response prior to the training might have been more able to practice CM than those who showed a higher stress response.

In order to address this weakness, the authors conducted a follow-up study using a separate sample of 32 healthy adults (Pace et al., 2010). The paradigm was identical to the one in the earlier study, except that the stress test was conducted prior to the training. No association was found between the stress response and subsequent amount of CM training. The authors interpret the results of their two studies to suggest that CM reduces subjective and physiological responses to psychosocial stress. However, a significant problem with these two studies is the choice of the active control group. First, they do not offer any clear alternative active psychological intervention procedure that has been practiced with the similar rigor of the CM. Second, the CM was taught by a highly expert teacher and practitioner with many years of training, whereas the active control was taught by graduate students with certainly little expertise, training or even practice with the protocol. Therefore, the active control condition is hardly better than a treatment-as-usual comparison.

5. Neurobiological correlates

The perception-action model of empathy states that observing and imagining another person in a particular state activates a similar state in the observer (Preston & de Waal, 2002). Consistent with this view are neuroimaging studies suggesting that observing or imaging another person's emotional state activates parts of the neurocircuitry, especially the insula and the anterior cingulate cortex, which are involved in processing that same state in oneself (Lutz, Brefczynski-Lewis, Johnstone, & Davidson, 2008; Lutz et al., 2009; Ruby & Decety, 2004; Singer et al., 2004). Studies by Davidson's group examining the brain activation using fMRI and psychophysiological correlates (heart rate) during meditation in Tibetan monks who had between 10,000 and 50,000 h of meditation practice, much while performing LKM and CM (Lutz, Brefczynski-Lewis, et al., 2008; Lutz, Slagter, Dunne, & Davidson, 2008; Lutz et al., 2009). In one of these studies, Lutz, Brefczynski-Lewis, et al. (2008) asked 15 expert meditators and 15 novices to either meditate or simply rest while they were presented with human vocalizations that were positive (baby laughing), neutral (background noise in a restaurant), or negative (distressed woman). Results showed that during meditation, activation in the insula was greater during presentation of negative sounds than positive or neutral sounds in the expert relative to the novice meditators, and that the degree of insula activation was associated with self-reported intensity of the meditation in both groups. An analysis of a subsample further revealed that the activation of the dorsal anterior cingulate cortex was associated with meditation, especially among the expert meditators. Furthermore, the right middle insula showed a greater association with heart rate across subjects. This association was stronger in the left middle insula when experts were compared to novices (Lutz et al., 2009).

The insula is important in detecting emotions and in mapping physiological symptoms to emotions (such as heart rate) and to make this information available to other parts of the brain. Furthermore, meditation increased activity in the amygdala, which is crucial for the processing of emotional stimuli, and in the right temporal parietal juncture, an area that is implicated in empathy and when perceiving mental and emotional states of others. In sum, these studies suggest that LKM and CM may enhance the activation of brain areas that are involved in emotional processing and empathy.

6. Treatment studies

Very little data exist on LKM and CM as a clinical intervention method. A study by Gilbert and Procter (2006) developed a treatment method the authors called compassionate mind training. The treatment consists of 12 weekly 2-hour individual sessions. The therapy targeted self-criticism and shame to enhance self-compassion by encouraging clients to be self-soothing when they are feeling anxiety, anger, and disgust. The treatment incorporates techniques of monitoring and cognitive-behavioral therapy, dialectical behavior therapy (Linehan, 1993), and acceptance and commitment therapy (Hayes, 2004). The authors tested the treatment protocol in a small group of patients. The study reported that the patients probably met criteria for personality disorders and/or chronic mood disorders. A total of 9 patients were initially enrolled (4 men and 4 women) in the study, and 3 patients dropped out, leaving 6 post-test completers and 4 follow-up completers. Only post-test completers were reported. Participants reported a significant improvement on self-report measures of anxiety, depression, and self-criticism. However, a major limitation of the study was the lack of a standard diagnostic assessment procedure.

Another study by Gilbert and colleagues examined efficacy of the same treatment protocol in people who met criteria for paranoid schizophrenia (Mayhew & Gilbert, 2008). A total of 7 potential participants, all of whom reported experiencing hostile auditory hallucinations, consented to participate. Of these, only 3 completed the treatment. Discontinuation was due to clinical deterioration in most cases. One person discontinued because she felt better. Treatment consisted of 12 1-hour weekly sessions. During treatment, therapists encouraged patients to focus on their difficulties with safety behaviors and become understanding and compassionate to those safety behaviors. Therapy also included a discussion on the function and value of self-compassion, and on the strategies to cultivate self-compassion by generating feelings of warmth and self-acceptance in response to self-critical thoughts. In this context, the therapist helped patients to have empathy for the fear and distress associated with these safety behaviors and to develop tolerance for some of these fears.

The intervention appeared to have had an effect on the hostile voices, turning them into less persecutory, less malevolent, and more reassuring voices. Furthermore, participants reported a decrease in depression, anxiety, and paranoia. However, the results have to be interpreted with caution given the small sample size, high dropout rate, poorly controlled design, and inadequate assessment methods. Given the preliminary nature of these studies and the fact that the techniques have little to do with Buddhist forms of meditation, it is doubtful that the procedure can be seriously compared to Buddhist approaches to LKM and CM.

7. Discussion

Meditation practices, especially mindfulness meditation, have become a popular and novel enhancement to contemporary cognitive-behavioral treatments (for review, see Hofmann, 2011 and Hofmann, Asmundson, & Beck, in press). Encouraging patients to experience the present moment nonjudgmentally and openly can effectively counter the effects of psychological distress (Bishop et al., 2004; Kabat-Zinn, 2003). Mindfulness meditation has been shown to have psychological benefits among diverse populations, including those suffering from the existential challenges of serious disease (Grossman et al., 2004, 2010; Hofmann et al., 2010; Kabat-Zinn, 2003). Cognitive-behavioral therapy has usually limited its focus on disorder-related cognitions. Buddhist phenomenology and meditation practices expand the range of investigated subjective mental states to include the full gamut of positive, negative, and neutral experiences manifested in thoughts, moods, emotions, images, and other mental content (Grossman, 2010).

In the Buddhist tradition, LKM and CM have traditionally been combined with other meditation practices—such as multi-sensorial mindfulness—and may well be efficacious techniques when added to existing empirically supported therapies, such as cognitive-behavioral treatments. A summary with a typology of meditational practices commonly employed as psychotherapeutic adjuncts is presented in Table 1 (for further discussion, see Hinton et al., in

press). This typology is organized in terms of mindset, defined as a certain attentional object viewed with a certain emotion/attitude (e.g., Bishop et al., 2004; Brown, Ryan, & Creswell, 2007; Grossman et al., 2004; Lau et al., 2006; Lutz, Brefczynski-Lewis, et al., 2008; Lutz, Slagter, et al., 2008; Shapiro, Carlson, Astin, & Freedman, 2006; Thera, 1962). The typology suggests treatment implications and provides avenues for future research areas. For instance, using neurophysiological and clinical methods, it might be particularly useful to contrast treatment changes that occur during these meditation techniques as compared to more traditional emotion-regulation strategies, especially in regard to social and affiliative measures (Barraza & Zak, 2009).

Despite obvious applications for clinical psychology, LKM and CM have only recently been studied by clinical researchers. Neuroendocrine studies suggest that CM may reduce stress-induced subjective distress and immune response (Pace et al., 2009, 2010). Moreover, neuroimaging investigations comparing expert and novice meditators indicate that LKM and CM enhance the emotional and somatosensory brain representations of other people's emotions (Lutz, Brefczynski-Lewis, et al., 2008, Lutz, Slagter, et al., 2008; Lutz et al., 2009).

The limited empirical evidence from the intervention literature suggests that elements of LKM and CM can be trained within a relatively short period of time. The study by Hutcherson et al. (2008), in fact, suggests that even a 7-minute training in LKM can produce small or moderately strong improvements in positive feelings toward strangers and the self. The LKM training period in the other studies with nonclinical populations consisted of six 60-minute weekly sessions (Fredrickson et al., 2008; Pace et al., 2009, 2010). The LKM exercise itself was only 15–20 min in duration (e.g., Fredrickson et al., 2008), although the effects were also modest. In clinical studies, the LKM training consisted of 8 weekly 1-hour sessions to reduce chronic low back pain (Carson et al., 2005), 12 weekly 2-hour sessions for treating anxiety, anger, and mood problems using a modification of CM (Gilbert & Procter, 2006) and 12 1-hour weekly sessions for treating paranoid symptoms in patients with schizophrenia (Mayhew & Gilbert, 2008). Therefore, LKM and CM appear to have a positive effect on psychological functioning even after a relatively short period of training time.

It could, nevertheless, be argued that comparisons of studies examining effects of very short-term directing of positive attention with studies of long-term LKM or CM training may not be appropriate because very different mechanisms may be activated by directing LKM for a few minutes to a stranger (Hutcherson et al., 2008) versus a systematic training in which participants spend many hours confronting repeated efforts to send LKM or CM to oneself, loved ones, or even enemies. Examining the effects of these practices in a laboratory by giving brief instructions to novices goes against the very basic Buddhist assumption that these abilities take considerable time and practice to develop (see Grossman, 2010). Therefore, it is quite possible that the training has very different effects when comparing novices with experts who have practiced for decades (as in the studies by Lutz, Brefczynski-Lewis, et al., 2008; Lutz, Slagter, et al., 2008; Lutz et al., 2009).

An additional issue relates to the fact that mindfulness meditation is used in the various Buddhist traditions as an important preliminary phase to establish concentration and attention required for LKM and CM (Analayo, 2003; Pandita, 1992; Sheng-Yen, 2001; The Dalai Lama, 2001). When effects upon LKM were examined alone in an intervention trial (Fredrickson et al., 2008), effects upon positive emotions were significant but small, and contrary to major assumptions of Buddhist psychology, there were no treatment benefits upon reduction of negative emotions. This may suggest that CM and LKM techniques require integration with mindfulness practices, and future research in this area is clearly needed.

In sum, existing research studies suggest that LKM and CM are highly promising practices for improving positive affect and for reducing stress and negative affect such as anxiety and mood symptoms. We hypothesize that LKM may be particularly useful for targeting interpersonal problems such as anger control issues, whereas both CM and LKM may be particularly useful for treating depression and relationship problems, such as marital conflicts, or counteracting the challenges among caregiving professions or nonprofessionals who must provide long-term care to a relative or friend. The primary reason for these hypotheses is directly rooted in the Buddhist tradition. The Buddhist tradition conceptualizes *metta* and *karuna* as being the two *brahma viharas* that are incompatible with anger, hatred, envy, and jealousy. And the usefulness of increased compassion for others and oneself should be self-evident in situations of long-term caregiving, whether familial or professional.

Given the small research literature, the empirical evidence is naturally limited. We also noticed a remarkable variation in the techniques that were used, even in this small database. For example, the modified LKM techniques employed in the study by Fredrickson et al. (2008) deviated from traditional LKM practices in ways they may have been somewhat inconsistent with the traditional practices (e.g., Buddharakkhita, 1995; Sujiva, 1991). Likewise, Gilbert and Procter (2006) and Mayhew and Gilbert (2008) developed an intervention that combines techniques from many other treatment approaches and encourages patients to cultivate self-compassion, which only vaguely resembles the initial stage of LKM. Furthermore, these findings are very preliminary and have to be evaluated with great caution. Despite these limitations, we believe that LKM and CM offer highly encouraging techniques that can be combined with established cognitive-behavioral treatment strategies.

Table 1
A typology of selected Buddhist meditation techniques employed in healthcare-related interventions and research studies.

Type of meditation	Attentional object	Cognitive-emotional perspective	Action tendency	Treatment targets
Sensorial	Sensorial experiencing in its various modalities[a]	Sensorial experiencing in its various modalities	Buffering approach, distancing responses	Anxiety, worry, rumination, depression, existential consequences of serious disease
Feeling state	Pleasantness, unpleasantness	Dispassionate, but kindly observation; Curious investigative	Buffering approach—distancing responses	Anxiety, worry, rumination, depression, existential consequences of serious disease
Complex mental states	Emotions, thoughts, images	Sensorial experiencing in its various modalities	Buffering approach, distancing responses	Anxiety, worry, rumination, depression, existential consequences of serious disease
Compassion (*karuna*)	All beings, including oneself	Compassion for the suffering of all beings, including oneself	Interactional and interpersonal engagement	Anger, hostility, depression, anxiety
Loving-kindness (*metta*)	All beings, including oneself	Happiness for all beings, including oneself		Anger, hostility, depression, anxiety

Note:
[a] Includes attending to the breath, kinesthetics (e.g., body movement in space), smells, sounds, or visual images (e.g., color, movement, shape) of bodily or external stimuli.

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