

A Proposed Protocol Integrating Classical Mindfulness with Prolonged Exposure Therapy to Treat Posttraumatic Stress Disorder

Lobsang Rapgay · Jae L. Ross · Owen Petersen ·
Christine Izquierdo · Monique Harms · Sandra Hawa ·
Sarah Riehl · Amanda Gurganus · Greta Couper

© Springer Science+Business Media New York 2013

Abstract Mindfulness is a strategy that has become increasingly considered as a potential treatment for posttraumatic stress disorder (PTSD). The aim of this study was to review and synthesize extant research on mindfulness, current mindfulness-based interventions, and evidence-based treatments for PTSD. A theoretical foundation for classical mindfulness and a preliminary protocol integrating classical mindfulness and prolonged exposure for the treatment of PTSD was introduced. We conducted a systematic search of relevant databases according to predefined criteria. Studies were eligible for inclusion if they sought to define mindfulness, employed mindfulness-based interventions for PTSD, or included evidence-based treatments for PTSD. Original Buddhist texts and resources were used to develop, support, and differentiate classical mindfulness from existing mindfulness-based interventions for PTSD. We identified a non-sufficient and inconclusive operationalization of the concept of mindfulness. Furthermore, there is limited research on the application of mindfulness for PTSD, and the few existing studies have demonstrated mixed results. The proposed integration of classical mindfulness with prolonged exposure appears to address specific limitations to current interventions for PTSD. A definition for classical mindfulness was drawn from the classic Buddhist teachings. The mastery and application of the components of classical mindfulness provide a potentially more effective way to use mindfulness for the treatment of PTSD. Al-

though, classical mindfulness has yet to be empirically investigated or supported.

Keywords Classical mindfulness · Exposure therapy · Posttraumatic stress disorder

Introduction

Posttraumatic stress disorder (PTSD) is an anxiety disorder characterized by the development of an array of symptoms following exposure and sometimes continued re-exposure to a significantly traumatic event (American Psychological Association 2000). Up to 60 % of Americans will experience at least one traumatic event in their lifetime (Foa et al. 2007). Studies demonstrate a lifetime prevalence rate of 8 % in the adult US population and highest rates (ranging from one third to more than half of those exposed) are found among survivors of rape, military combat and captivity, and ethnically or politically motivated internment and genocide (American Psychological Association 2000).

Because mindfulness has been shown to be a promising adjunct and treatment for a number of psychiatric and psychosomatic disorders, there are attempts made to study whether it is effective for PTSD. According to current definitions, mindfulness is the process of being fully present with each moment of one's experiences in an accepting and non-judgmental manner (Kabat-Zinn et al. 1992). However, currently employed versions of mindfulness have been modified significantly from classical mindfulness (CM), which is the ancient form of the practice as articulated in original Buddhist teachings, most notably the Four Foundations of Mindfulness (*Satipatthana-sutta*). This CM practice entails the sequential acquisition of mindfulness of bodily sensations, feelings, thoughts, and mental objects (Analyo

L. Rapgay (✉)
Department of Psychiatry and Biobehavioral Sciences,
University of California Los Angeles, 300 Medical Plaza,
Suite 2331, Los Angeles, CA 90095-6968, USA
e-mail: lrappgay@mednet.ucla.edu

J. L. Ross · O. Petersen · C. Izquierdo · M. Harms · S. Hawa ·
S. Riehl · A. Gurganus · G. Couper
Alliant International University, Alhambra, Los Angeles, CA, USA

2006). CM involves the acquisition of refined perceptual and cognitive skills, such as concurrent focal and broadening the breadth of attention to know internal and external experiences objectively so that maladaptive thoughts, feelings, and behaviors can give way to more adaptive ones (Rapgay and Bystrisky 2009).

Researchers generally agree that current treatments for PTSD, though effective, face limitations, such as high dropout rates, treatment resistance, and symptom persistence long after completion of treatment. Mindfulness is a strategy that has become increasingly considered as a potential alternative treatment for PTSD. This paper introduces the theory and practice of the original Buddhist form of mindfulness, what this paper refers to as CM, and proposes how clinically integrating this form into prolonged exposure therapy, a well supported clinical intervention for PTSD, may increase the effectiveness of treating anxiety disorders. In an effort to further define and refine mindfulness skills and specific clinical utility, this paper will focus solely on PTSD treatment intervention in an attempt to introduce a tailored protocol for a specific clinical presentation.

Current PTSD Treatments

Current evidenced-based treatments for PTSD include cognitive processing therapy (CPT), prolonged exposure (PE), stress inoculation therapy, rapid eye movement desensitization and reprocessing, virtual reality, and cognitive therapy and selective serotonin reuptake inhibitors, sertraline (Zoloft), and paroxetine (Paxil) (Karlin et al. 2010; VA/DoD 2010).

Studies examining the effectiveness of trauma-focused and psychotropic interventions used with mixed PTSD samples have demonstrated a variety of significant posttreatment outcomes (Chard 2005; Ehlers et al. 2003; Foa et al. 1999; IOM 2008; McLay et al. 2011; Ponniah and Hollon 2009; TARRIER et al. 1999; Van Der Kolk et al. 2007; Weiderhold and Weiderhold 2010). Research studies and meta-analysis have provided inadequate efficacy data in the treatment of PTSD primarily because of methodological limitations, such as limited focus on reduction in symptom criteria, and inconsistency in outcome findings (Friedman et al. 2007; IOM 2008; Stein et al. 2003).

PE studies have demonstrated between 47 % (Schnurr et al. 2007) and 60 % efficacy (Rauch et al. 2009; Tuerk et al. 2011). In a meta-analytic review by Bradley et al. (2005), non-response rates to PTSD treatments were shown to be as high as 67 % for PE intervention. Also, several study reviews highlighted that many trauma-exposed victims could not engage in exposure-based therapies that involve repeated confrontations of the traumatic situation causing high levels of anxiety, due to a lack of adequate required coping skills needed to benefit from these treatment modalities (Foa et al. 2007; Follette and Vijay 2009; Owens et al. 2012; Resick et al. 2002; Sharpless and Barber 2011; Tuerk et al. 2011; Vujanovic et al.

2011). One meta-analytic review of outcome PTSD literature found that treatment dropout rates for PE and CPT range from 0 to 50 % among various population samples (Schottenbauer et al. 2008).

Although extant literature has predominantly explored statistically significant findings that indicate a response to treatment (e.g., reduction in symptom criterion), it becomes relevant to differentiate between statistical (i.e., numeric improvements on a measure) and clinical significance (i.e., meaningful change in an individual's life), in that the latter has yet to be included as a dominant outcome measure in the traditional evidence-based treatments for PTSD (Hayes et al. 1999). Thus, considering the discrepancies and limitations in efficacy and research findings examining standard treatments for PTSD, there has more recently been considerable emphasis placed on incorporating integrative and alternative health care interventions to existing evidence-based treatment protocols.

Definition of Mindfulness

The concept of mindfulness has its roots in Eastern introspective psychological practices, specifically Buddhist psychology, over 2,500 years ago (Black 2011). Mindfulness is first found in the Buddhist writing *Satipatthana-sutta* in a summary about meditation (Analayo 2006). The term “mindfulness” stems from the Pali word *sati*, which translated means possessing awareness, attention, and remembering (Bodhi 2000). Western science has empirically studied mindfulness for approximately 40 years and the definition has been continually revised (Black 2011). The most recognized Western definition of mindfulness comes from Dr. Jon Kabat-Zinn, a central founder of mindfulness research. He defined mindfulness as purposely paying attention in the present moment and without judgment (Kabat-Zinn 1994). Kabat-Zinn went on to note, “This kind of attention nurtures greater awareness, clarity, and acceptance of present-moment reality” (p. 4). Although mindfulness has been defined and measured in many ways by different researchers, there is general agreement regarding the involvement of sustained attention to the present moment; yet, differences exist between the proposed definitions, and an unequivocal operational definition of the construct of mindfulness has not been reached (Chiesa and Malinowski 2011).

Classical Mindfulness

To address the various definitions and current inconsistencies in understanding mindfulness, this paper explores the original constructs of mindfulness as a foundation for developing an operational definition. The Four Foundations of Mindfulness entails the sequential acquisition of mindfulness of bodily sensations, feelings, thoughts, and mental objects (Thera

1998). The original Buddhist teaching of The Four Foundations of Mindfulness has been adapted for clinical application (*Satipathana-Sutra*) and integrated the practice of *samatha* (concentration), with *vipassana* (insight) (Thanissaro 1995). This paper references Bikkhu Analayo, a prominent scholar/practitioner in the ancient texts of Buddhism because his version is most consistent with scientific findings about sustained attention and distributed attention in Western cognitive sciences as compared to existing alternate versions (Analayo 2006).

This paper defines CM as the practice and process of gaining selectively sustained and distributed attention skills. Sustained attention is the cognitive capacity to maintain focus on an object or everyday task (Seli et al. 2012). Distributed attention is the cognitive capacity to expand the breadth of attention to access and process peripheral information (Rowe et al. 2007). The process of CM involves training in sustained attention skills to know maladaptive sensations, thoughts, feelings, and behaviors to such degree that attentional resources currently invested in them may become available for processing peripheral information, also defined as distributing attention. These two main constructs of CM can facilitate experiential insights into triggers and links among the focal and peripheral information as a means of developing adaptive thoughts in lieu of maladaptive sensations, thoughts, and feelings (Thera 1998).

Central to the practice of CM is utilizing sustained and distributed attention to increasingly know a focal task/object and allocating freed attentional resources for accessing and processing peripheral information. These mechanisms of CM are consistent with attentional load theory in cognitive psychology and neuroscience. Attentional load theory is a robust finding in the study of attention (Lavie et al. 2004). The theory shows that when a complex central/focal task or object is mastered, meaning it is known so well that it becomes second nature to the individual, the attentional resources once highly invested in it are then released and made available for peripheral contextual information (Lavie et al. 2004). Analayo (2011) described the process of body mindfulness as the incremental decrease in effortful attention on the abdominal breathing, thus freeing attentional resources that can be distributed toward processing peripheral bodily sensations (Analayo 2011). More importantly, this practice of concentration (*samatha*) verifies that once one achieves sustained attention on the object, the object no longer requires the same amount of mental effort and attention to engage with it (Lutz et al. 2008).

To acquire sustained and distributed attention, one must first master six major perceptual and cognitive processes associated with sustained attention (sensory awareness, sustained attention, non-controlling/non-judgmental approach, processing hindrances, processing conflicts in learning, monitoring), and two associated with distributed attention (mental flexibility and peripheral processing) (Rapgay and Bystrisky 2009). Training in these processes over time leads to acquiring mental skills,

which can be applied therapeutically to change maladaptive thoughts, feelings, and behaviors into adaptive ones (see Fig. 1 for a brief overview of the processes and their therapeutic effects).

The first process is awareness training: the ability to maintain a sense of the self-observing the focal object/task. With practice, this process becomes a metacognitive skill to observe one's own experience (thoughts, feelings, and sensations). The metacognitive skill is applied therapeutically to facilitate subject-object differentiation, a perceptual and cognitive function critical to processing external and internal threatening information effectively (Fox and Riconscente 2008). People with severe anxiety disorders, such as PTSD, tend to identify the experiences of anxiety with the self in an undifferentiated state and therefore cannot effectively observe and process their thoughts and feelings (Hart et al. 2008).

Re-experiencing, a primarily sensory reliving of the trauma in the present moment, is a symptom in which the individual cannot differentiate between the self and his or her sensory experiences (Ehlers et al. 2004). Awareness training is a potential strategy to help anxious individuals to differentiate between the self as observer and the sensations as the observed (Garland and Gaylord 2009).

Mastery of awareness leads to the next process: selective sustained attention. This is the process of selecting one stimulus from many and focusing on it for prolonged periods of time. Sustained attention in CM is an engaged, perceptual and cognitive activity with the objective to observe many details of the object and memorize them for future recall (Lamrimpa 2011). Knowing an object through such focused observation facilitates habituation to threatening objects and consequently serves as a form of exposure strategy. Repeated exposure via selective sustained attention may help to discredit and disconfirm the projected threatening meaning ascribed to the trigger of anxiety (Vujanovic et al. 2009).

The six processes, mental skills, and therapeutic effects

1. Sensory Awareness → Metacognitive skills → Subject Object differentiation
2. Sustained Attention → knowing details through exposure → habituation and tolerance → inhibition of non-relevant information → attentional control
3. Non-controlling, non-judgmental approach → unbiased state → non-resistance to all types of pleasant and unpleasant experiences
4. Processing Hindrances = overcoming resistances = overcoming avoidance behavior
5. Processing conflicts in learning = overcoming processing conflicts = increase proficiency
6. Monitoring = increase prioritizing, controlling and executing = increase executive functioning

Fig. 1 The six processes, mental skills, and therapeutic effects

One way in which sustained attention facilitates prolonged exposure is by helping individuals develop and enhance their attentional control or the ability to inhibit interference from distracters and habitual response patterns. The more effective an anxious individual is in utilizing attentional control, the more likely he or she will be able to sustain attention on the object of mindfulness (Thera 1998). Research has shown that subjects with high anxiety who have good attentional control are better able to manage their responses to threatening stimuli as compared to those with poor attentional control (Eysenck et al. 2007).

Engaging in a non-judgmental and non-controlling way enhances the therapeutic effects of training in awareness and sustained attention. Maintaining awareness in this manner involves not evaluating and judging past-, present-, and future-related thoughts and feelings and at the same time avoiding active suppression of unwanted thoughts and feelings that arise to consciousness (Thera 1998). The process also includes avoidance of making conscious efforts to invite or actively show curiosity about thoughts and feelings. For instance, if a judgmental thought arises, one does not evaluate it or try to inhibit it from the experience. By allowing thoughts to arise without judgment and control, particularly those normally inhibited, one is effectively learning to deter habitual reactive processes. This is critically important to the effective management of anxiety induced by habitual reactions (Behar et al. 2009).

Managing distractions and hindrances that arise during attempts to master the other processes is vital to mindfulness practice. Distractions are casual external or internal stimuli that suddenly arise outside one's control. Identifying, labeling, and relinquishing them process such stimuli. On the other hand, hindrances are resistances consciously or unconsciously activated to avoid the practice of mindfulness (Bodhi 2000). For instance, a common response of many individuals initially training in mindfulness is, "it is too difficult." This response can be an example of the resistance to engaging in the practice of mindfulness. Anxious individuals commonly engage in such resistance strategies (conscious and unconscious) when encountering a challenging task in their lives and most often tend to use the same pretext as a way to avoid the stress of learning something demanding, difficult, or triggering (Rapgay and Bystrisky 2009). Hindrances that arise while engaging in mindfulness practice must be identified and addressed using standard psychotherapeutic processing approaches, like psychodynamic or cognitive behavioral therapy, in order to successfully proceed in mindfulness training.

The success of acquiring proficiency in sustained and distributed attention depends on mastery of a number of secondary processes. Sustained and distributed attention training involves multiple perceptual and cognitive subtasks. Many of these subtasks are conducted simultaneously or back-to-back, innately causing conflicts in balancing them. Processing such conflicts is

a major problem that requires addressing them systematically when detected (Rueda et al. 2005). Without resolution, these conflicts can remain as major obstacles to progress in training (Rapgay and Bystrisky 2009).

Equally important is the process of periodic monitoring during mindfulness training. Periodically monitoring an individual's level of performance, which subtasks are performed easily and which present a challenge, is critical to enhance an efficient learning of sustained attention. Monitoring facilitates executive functions of prioritizing, controlling, and executing perceptual and cognitive tasks (Korenblum et al. 2007). Due to limited attentional resources, one key to successful training is wise and efficient management of resources. Periodically monitoring is critical to employing one of mindfulness' central functions of developing experiential insights into maladaptive thoughts, feelings, and behavior (Bodhi 2011).

Broadening and Distributing Attention

Mastering mindfulness of the focal object frees attentional resources that can be distributed to access and process the peripheral environment (Analayo 2011). When one anchors part of their attention on a task such as even abdominal breathing cycles and distributes the remaining attention to the rest of the body, a sense of expansion and movement is created (Analayo 2011). This process of creating a sense of internal expansion and movement is critical for facilitating mental flexibility: the ability to respond mentally to challenges in adaptive ways. A sense of expansion and movement is vital to combat the narrow and rigid state of mind activated by anxiety, which inhibits the individual's ability to access and process peripheral contextual information (Gable and Harmon-Jones 2012).

Familiarity with anchoring and distributing of attention techniques allows an individual to become more sensitive to distressing bodily sensations. This facilitates an individual's selection of the more distressing sensations and allocation of some attention towards them in a non-judgmental and non-controlling way. When he or she can do so effectively, the joint effect of the innate relaxation generated by the even abdominal breathing cycles and peripheral processing of the primary distressing bodily sensation reinforce each other to reduce the intensity of the sensations naturally (Analayo 2011). When achieved, the same process is applied to anxiety-related thoughts and feelings that maintain the primary bodily sensations.

Classical Mindfulness Training to Acquire Sustained Attention

Acquiring skills in sustained and distributed attention is achieved through formal training sessions in an 8-week protocol of six daily sessions of approximately 25 min. Because

acquisition of the skills is dependent on regular and formal training, individuals need to be ready and willing to undergo this kind of training for optimal benefit. Acquiring mastery and efficiency in each of the four modules is necessary before proceeding to the next because the modules build upon one another (Rapgay and Bystrisky 2009).

Training in sustained and distributed attention is challenging. Research in sustained attention shows that mental fatigue sets in rapidly after the initial activation (Mackworth 1968). In traditional Buddhist meditative traditions, mental fatigue is a major concern, and emphasis is placed on regulating the employment of mental and physical effort as one way to manage mental fatigue (Wallace 1999).

Module I of the current classical mindfulness training is designed to help regulate the application of physical and mental effort by mastering the relaxation of the body as a complement to generating a settled, alert state of mind. These are acquired through the practice of five exercises that progressively build upon one another in the first 2 weeks. The objective is to create a mental and physical state capable of managing the challenges and demands of sustained attentional training (Mackworth 1968).

The first exercise is to master abdominal breathing to the point in which one can do it without focused attention. To start, one directs attention to each rising and falling of the abdomen continuously from beginning to end of each cycle without any interruptions from distractions. The objective is to sustain attention continuously and progressively for increasing numbers of abdominal breathing cycles. The goal is to finally sustain attention for 3 min or more without any mental interruptions (Rapgay et al. 2011). Once this skill is mastered, one learns to consciously activate long and short abdominal movements. Then, one learns to induce even, smooth rising and falling abdominal movements to the point that they can be generated without conscious effort. When generating even smooth risings and fallings of the abdomen without conscious effort is mastered, the fourth exercise teaches individuals to employ that ability to expand the abdominal relaxation gradually to the rest of the body.

Once able to generate natural relaxation of the tense body by employing the even smooth abdominal movements, one is ready to engage in the final exercise. In this exercise, the individual places and holds attention to the specific area underneath two fingertips placed on the upper abdomen and attends to each even rising and falling of the abdomen. Repeated practice of the dual tasks is designed to facilitate the ability to place and hold attention and carry out the task with increasing comfort and ease. This skill of placing and holding attention is critical for training sustained attention. Without the ability to hold the object steady, it is difficult to sustain attention on the object for any period. This is akin to trying to sustain focus on a constantly moving external object, compared to one that is static (Wallace 1999).

While these exercises seek to create the basis for sustained attention, they also serve the function of training the anxious individual in bodily sensory awareness. This serves as a means to acquire metacognitive skills and subject–object differentiation or the ability to be aware of one’s own sensations, thoughts, and feelings objectively. This is a necessary clinical function to manage severe anxiety (Vakili and Fada 2006).

When one can successfully accomplish the above task, the next training is in broadening and distributing the remaining attentional resources to the rest of the body. Repeatedly sustaining attention on the details of the abdominal breathing cycle for 3 min or more results in knowing the cycles so well that one can divest some of the attentional resources from the activity to the rest of the body without compromising the integrity of the activity.

Sustained attention training, or *samatha*, involves systematic performance-based tasks. The process facilitates learning and motivation by rewarding one’s self when the specific goals of the practice are achieved. Rewards and reinforcements of gains achieved create a sense of self-efficacy critical to the success of sustained attention training (Tompsonowski and Tinsely 1996).

Review of Current Mindfulness-Based Interventions

Currently, there exist several interventions that integrate mindfulness-based exercises that have been considered for use with PTSD. Mindfulness-based stress reduction (MBSR) is a structured group program of mindfulness training developed by Kabat-Zinn (1990). MBSR consists of multiple forms of mindfulness practice, including formal and informal meditation practice as well as *hatha* yoga (Kabat-Zinn 1990). MBSR has been shown to produce moderate to marked reductions in anxiety and depression (Kabat-Zinn et al. 1992; Ramelet et al. 2004), two common conditions comorbid with PTSD (Kessler et al. 1995). Kearney et al. (2012) recently conducted an open trial study to assess the acceptability and safety of MBSR techniques for veterans with PTSD. The study included 92 combat veterans in treatment for PTSD. Participants were grouped together in groups consisting of 20–30 participants each and taught MBSR skills adjunctive to their usual care. Self-report measures revealed that participants experienced significant improvement in mental health, “including measures of PTSD, depression, experiential avoidance, and behavioral activation as well as mental and physical health-related quality of life,” including an increase in mindfulness skills at a 6-month follow-up (Kearney et al. 2012, p. 111). However, the lack of inclusion of a control arm and non-randomized inclusion of study participants greatly diminish the validity and subsequent conclusions of the study. Symptom improvement

could be attributed to a variety of confounding factors in addition to MBSR training such as non-specific effects related to participation in a group or provider interaction. Despite the limitations, the study suggests that veterans with PTSD may benefit safely from including mindfulness skill training as adjunct to their usual clinical care. This study's findings support that future research on MBSR for PTSD is warranted.

Acceptance and commitment therapy (ACT) seeks to help clients become more mindful of thoughts, accept private experiences without judgment, develop greater clarity about personal values, and commit to needed behavioral change (Walser and Westrup 2007). Walser and Westrup (2007) developed an ACT-based intervention for treating PTSD, which includes daily mindfulness exercises to enhance the ACT principles of "acceptance of experience, de-fusion from the literal meaning of thought, continuous contact with the present moment, and transcend sense of self" (p. 17). However, clinical outcome data utilizing the ACT protocol are significantly lacking, thus any conclusions regarding efficacy and effectiveness are greatly limited.

Dialectical behavioral therapy (DBT) is a multifaceted therapy shown to be effective in treating borderline personality disorder and related problems successfully (Linehan 1993). DBT is sometimes used to address difficulties with emotion regulation and distress tolerance prior to the implementation of PTSD-specific treatments such as exposure therapy (Wagner and Linehan 2006). DBT incorporates mindfulness training as one of four skill-building areas. As reported in Vujanovic et al. (2010), "In DBT, mindfulness involves three 'what' skills (observing, describing, and participating) and three 'how' skills (taking a non-judgmental stance, focusing on one thing in the moment, and being effective)" (para. 12). Although a review of the literature reveals that a randomly controlled trial using DBT for PTSD treatment has yet to be conducted.

In mindfulness-based cognitive therapy (MBCT), Segal et al. (2004) created an intervention to prevent relapse of depressive symptoms. In the intervention, patients are taught to mindfully focus on everyday events without avoiding or suppressing them. Although MBCT has been well studied in the recurrence of depression, a randomized control trial (RCT) involving MBCT and PTSD has yet to be conducted.

A review of the literature reveals there has yet to be an RCT examination of the clinical use of integrating mindfulness-based interventions in existing empirically supported treatments for PTSD. However, "relevant theoretical and empirical literature suggests that mindfulness may serve clinically meaningful functions in alleviating PTSD symptoms" (Vujanovic et al. 2010, para. 2). Combining mindfulness with existing empirically supported PTSD treatments may strengthen emotion regulation and improve treatment dropout rates by helping clients become more engaged with a therapist or treatment process. Additionally, mindfulness interventions can prepare clients to better tolerate

unpleasant emotions elicited from processing trauma (Follette et al. 2006; Vujanovic et al. 2010).

Challenges with the Current Understanding of Mindfulness

Mindfulness is a key component of a number of current mindfulness-based interventions for PTSD and other anxiety disorders. Unfortunately, in the variety of interventions, a uniformly accepted and clearly defined operationalization of mindfulness does not exist, making it difficult to determine its active agent of change (Bishop et al. 2004). Without operationalizing mindfulness, further research is limited to effectiveness studies.

Attention has been described as a main function of mindfulness, yet it is not clear what type of attention is associated with the various mindfulness interventions. Because it is well established that attention is a complex, multifaceted system, it is important to know what type of attention is being trained (selective, sustained, divided, distributed, etc.). When such distinctions are not made, varying measures of attention may be employed to determine the effect of mindfulness leading to varying outcomes.

While some interventions assign acceptance as a central function, original forms of mindfulness do not associate acceptance as a feature of mindfulness for a number of reasons. The original forms associate mindfulness with the integrated practice of *samatha* (concentrative) and *vipassana* (insight) skills, to know things as they are rather than the habitual way of knowing them on the basis of how one wishes them to be, or how one thinks they are. Consequently, mindfulness seeks to develop an objective, engaged state of mind capable of carrying out this type of learning.

As a result of these issues and other factors, there has been a slow but growing interest to revisit the original mindfulness teachings from the Buddhist texts to increase the understanding of the perceptual and cognitive theory underlying mindfulness. The trend can already be observed in the shift from MBSR to a more traditional *vipassana* form in mindfulness-based cognitive therapy, a validated treatment protocol for reducing the recurrence of depressive episodes (Teasdale et al. 2000).

Differences Between CM and Alternative Mindfulness-Based Interventions

Although there are similarities among existing mindfulness-based interventions such as ACT, DBT, MBSR, etc., there are significant differences between these alternative approaches and CM. Broadly speaking, alternative approaches to mindfulness train individuals to watch, observe, and maintain a somewhat detached state from negative catastrophic thoughts, feelings, and bodily sensations (Teasdale et al. 2000). In CM,

individuals are initially taught to develop a mental distance between themselves as an observer and their experiences. The objective is to help the individual develop subject–object differentiation between themselves and their cognitive and emotional experiences. Once the individual acquires the ability to differentiate, he or she is trained to directly experience anxiety-related bodily sensations, thoughts, and feelings by inhibiting habitual tendencies to elaborate, describe, and give meaning (Sayadaw 2010). According to CM, detaching from direct experience in order to watch anxiety-related sensations, thoughts, and feelings is a form of avoidance since detachment gets in the way of direct experience. Furthermore, processing thoughts, feelings, and sensations, as is encouraged in alternative approaches, has been shown to interfere with the exposure process during exposure therapies and actually serves as avoidance (Barlow 1993). In contrast, CM strives to inhibit processing of such thoughts and feelings in order to directly engage the object of experience (Sayadaw 2010).

More specifically, the two vary in a number of other important ways. The first is in terms of the type of training in attentional control. Alternative interventions focus on repeated attentional switching (i.e., attend to the breath until a thought, feeling, or sensation enters awareness, at which time the individual is encouraged to become curious about these experiences). On the other hand, CM focuses on maintaining singular sustained attention on an individual, selected object. Because the goal of sustained attention in CM is to know the object completely, attention is manipulated to retain the integrated object in memory for later retrieval. Consequently, any other object or experience that is non-relevant and distracts from the process of knowing is immediately inhibited (Lamrimpa 1992).

Alternative approaches encourage exploring and discovering thoughts and feelings that arise during focusing on the breathing (Kabat-Zinn 1990). Encouraging switching of attention in this manner disrupts continuous sustained attention on the selected object by focusing on processing rather than experiencing the object. In CM, sustained attention shifts from detection and categorical discrimination to knowing the specific details of the selected sensation, feeling, or thought. Such detailed knowledge of an anxiety-related sensation, feeling, or thought allows for more immediate recognition of such a feeling as it arises as well as the personal consequences of the thought, feeling, or sensation. Consequently, motivation to direct oneself to process the triggers and maintaining factors of the experience in order to find a more adaptive approach is enhanced.

Another important difference between the two approaches is the explicit emphasis alternative approaches place on acceptance of experience (accepting whatever enters awareness without control or judgment) (Baer 2006). This approach encourages individuals to view thoughts as simply thoughts and not facts and trains in the ability to dismiss experiences once they enter one's awareness without any subsequent training in understanding the features or

functions of object (e.g., thoughts) or strategies to overcome maladaptive judgments and control (Teasdale et al. 2000). The underlying assumption according to the proponents of this approach is that by instructing an anxious individual to proactively inhibit negative, thoughts, and feelings, he or she will be able to distance him or herself from becoming ensnared negativity (Teasdale et al. 2000). Such an approach is not new in psychotherapy. Anxious individuals, to avoid experiencing the anxiety and distress caused by their fears, have long used reassurance and safety thoughts. Furthermore, it is well known that such approaches provide transient relief and continue to do so as long as the individual buys into the process (Leahy 2003). However, clinical literature shows that in reality, anxious individuals believe that negative thoughts are real and factual and need to be avoided in the first place. The belief is rooted in schemas that are deep seated, and therefore, it is unlikely safety thoughts such as “negative thoughts are just thoughts and not real” may change the underlying triggering schema. Consequently, such thoughts act as negative reinforcers that in the long run increase the fear (Leahy 2003).

In contrast, CM regards any preconception or value such as acts of acceptance as barriers to experiencing sensations, thoughts, or feelings as they exist—such preconditions shape and color the real experience (Rapgay and Bystrisky 2009). In CM, the individual is trained to know through direct experience how negative and positive thoughts and feelings produce negativistic or positive behavior that leads to more pain and suffering or more internal calm and adaptive behavior, respectively. Maladaptive judgmental thoughts and control are replaced with more adaptive judgments and control abilities in order to manage one's anxiety (Rapgay and Bystrisky 2009).

Training in broadening of attention to increase mental flexibility is another factor in which CM and alternative approaches differ. In CM, one of the main objectives of training sustained attention is the development of broadening of attention (Analayo 2006). Sustained attention is employed to know the object so well that it can be accurately reproduced in memory even when the object is not within perceptual access. The invested attention and mental effort can now be divested and distributed toward concurrent processing of peripheral information. Broadening of attention facilitates decreasing mental rigidity associated with anxiety. Mental flexibility facilitates alternative ways of processing anxiety-related thoughts and feelings and derives broader and more global insights (Gable and Harmon-Jones 2012).

We have presented a broad overview of a few of the important differences between CM and alternative approaches in an effort to differentiate consequent clinical implications of integrating CM with an empirically supported exposure intervention such as prolonged exposure therapy. Additional subtle differences exist, but further detailed discussion and exploration of such differences are beyond the scope of this paper.

Prolonged Exposure Therapy

Of the current empirically supported treatments for PTSD, Foa's (2007) prolonged exposure therapy appears most appropriate to benefit from integrating CM. Prolonged exposure therapy is a cognitive-behavioral program used to treat adults with previous experiences of trauma that have as a result suffered PTSD. Through cognitive restructuring, and in vivo and imaginal exposures, PE helps an individual to confront anxiety-evoking situations to minimize or eliminate excessive anxiety (Foa et al. 2007).

The treatment program consists of 10–15 weekly or twice-weekly treatment sessions typically lasting 90 min each. During session 1, the therapist presents an overview of the program (25–30 min), discusses the treatment procedures that will be used in the program, explains that the focus of PE is on PTSD symptoms, collects information relevant to the trauma using the Trauma Interview (45 min), introduces breathing retraining (10–15 min), and assigns homework (5 min). Session 2 gives clients the opportunity to provide a detailed narrative about their reactions to the trauma and how it influences them. The structure of the session is as follows: review homework (5–10 min), present agenda for session (3 min), educate client about PTSD symptoms by discussing common reactions to trauma (25–30 min), discuss the rationale for exposure with emphasis on in vivo (real-time direct experience) (10 min), and introduce the Subjective Unit of Distress Scale, a hierarchical rating scale of subjective experience of distress (5 min). Next, the therapist and client construct an in vivo hierarchy, a prioritizing of anxiety-provoking situations unique to each client (20 min), and then select in vivo assignments for homework (15 min). Session 3 begins with homework review (10–15 min) followed by presentation of the rationale for imaginal exposure or assisting the client in visualizing and recounting the traumatic events (10–15 min). Following this explanation, the therapist conducts imaginal exposure (45–60 min), processes with the client (15–20 min), and assigns new homework (5 min) (Foa et al. 2007).

Intermediate sessions (4–9 or more) consist of homework review, followed by up to 45 min of imaginal exposure, 15–20 min of post-exposure processing of thoughts and feelings, and approximately 15 min of in-depth discussion of in vivo homework assignments. As treatment progresses, the client is encouraged to describe the trauma in great detail during the imaginal revisiting and focus on the most distressing aspects of the trauma experience or memory “hot spots.” In later sessions, imaginal exposure becomes shorter (about 30 min) as the client improves (Foa et al. 2007).

The final session includes homework review, 20–30 min of imaginal exposure, discussion of the exposure, with emphasis on how the experience has changed over the course of treatment, and a detailed review of the client's progress. It is imperative in this final session to integrate the processed information back into their personal narrative. The final part of the

session is dedicated to discussing continued application of techniques learned in treatment, relapse prevention, and treatment termination (Foa et al. 2007).

Integrating Classical Mindfulness with Prolonged Exposure Therapy

Currently, the consensus is that mindfulness is a complementary adjunct to various standard treatments of psychiatric disorders (Segal et al. 2004). Consistent with this viewpoint, we present an integrated protocol combining CM with PE therapy, with the effort to ensure that inclusion of CM is not used to duplicate, replace, or contradict any clinical functions addressed effectively by PE (see Fig. 2 for a brief summary of the protocol).

As noted, PE (Foa et al. 2007) involves imaginal and in vivo exposure to the trauma via multiple narratives of the primary trauma event in an effort to identify the most distressing reactions and resistances and process and restructure those reactions and

Phase I: Sessions 1-2	<ol style="list-style-type: none"> 1. Psycho-education 2. Training in the 5 preliminary exercises of CM 3. Multiple Narratives of the Primary Trauma Episode to reduce anxiety and identify the hot spots
Phase II-Part A: Sessions 3-4	<ol style="list-style-type: none"> 1. Treating cluster symptoms of re-experiencing, hyper-sensitivity, numbness, and anger/aggression with CM strategies of (a) subject object differentiation (b) inhibition of habitual negativistic responses, and tolerance of threat via exposure 2. In vivo Exposure
Phase II-Part B: Sessions 5-8	<ol style="list-style-type: none"> 1. Treating Hotspots/Resistances such as catastrophic, negativistic thoughts, severe anxiety, and avoidance behavior with (a) Socratic Questioning (b) Evidence for and against, and (c) Behavioral Experimentation 2. Treating Hotspots/Resistance with (a) Placing and Holding attention on the image associated with the trigger of trauma (b) Processing resistances to holding attention on the triggering image (c) Integrating the adaptive thoughts and feelings into the text of the narrative (d) Repeated reading the modified narrative (e) Process hotspots and resistances as described above (f) Develop habituation to the triggering image (g) Conscious relaxation of mental effort and attention from the triggering image and distributing much of it towards the rest of the body to process bottom up distressing bodily sensations, anxiety producing thoughts and feelings.
Phase III: Sessions 9-12	<ol style="list-style-type: none"> 1. Integrating adaptive thoughts, and feelings into the entire text of the narrative reading it several times 2. Relapse Prevention

Fig. 2 Summary of the protocol

resistances into adaptive thoughts, feelings, and behaviors into the relevant part of the narrative. Multiple narrations of the trauma help to reduce anxiety, reduce avoidance behavior, and recall and link fragmented memories about the trauma (Foa et al. 2007).

CM on the other hand has two major therapeutic functions that are not directly provided by PE: first to directly treat attention, memory, and other cognitive impairments associated with trauma and second to develop tolerance toward the negativistic and threatening experiences via prolonged and repeated exposure (Treanor 2011). Generally, when PE is applied as a stand-alone treatment, a variety of CBT strategies are used to process resistances (Foa et al. 2007). However, we recommend complementing CBT strategies with CM so that attentional and memory impairments can be directly targeted for better treatment outcome.

Numerous studies show major attentional, memory, and other cognitive impairments associated with PTSD (Hart et al. 2008). Research supports the neuropsychological evidence about memory deficits in this disorder with the finding that many PTSD individuals have a smaller sized hippocampus, the part of the brain associated with memory (Jatzko et al. 2006). Research also shows that PTSD individuals demonstrate an attentional bias toward trauma-related stimuli compared to control groups (Pineles et al. 2009). Studies reveal individuals with PTSD exhibit significant difficulty with executive functioning in prioritizing, controlling, and executing cognitive and perceptual tasks (Aupperle et al. 2011).

While PE may indirectly reduce the related cognitive impairments in attention and memory, it has been shown that strategies that directly target attentional and memory problems associated with anxiety and attentional disorders reduce correlated symptoms (Amir et al. 2010). CM could enhance the treatment of PTSD because it directly trains sustained attention and facilitates memory function.

Rationale for employing CM as a secondary exposure intervention is twofold. The first is to reduce resistance to PE-based exposure that many individuals experience, and often results in a high dropout rate, by developing a foundation of metacognitive skills that will assist in coping with distressing experiences triggered by subsequent exposure techniques (e.g., bodily sensations). Second, CM exposure seeks to develop tolerance for the perceived threat in trauma rather than aiming to extinguish fear, as in the case of PE. Developing tolerance is more manageable for individuals because it produces less anxiety and distress (Zvolensky et al. 2011).

Phase I of the 12-Week Integrated CM-PE Treatment Protocol: Sessions 1 to 2

In the first two sessions, individuals are provided psychoeducation about the main symptoms of PTSD, how the treatment

works, and what is required of them. Individuals will also train in the five exercises of the preliminary practices of CM (see details of the exercises above) and narrate the primary trauma episode several times in the sessions. During the multiple narratives of the primary trauma episode, the therapist focuses on identifying hot spots or resistances that the individual exhibits during the narrative in order to form a hierarchical list of these resistances (Foa et al. 2007).

Before addressing hot spots, the therapist needs to focus on treating the severe cluster of symptoms associated with trauma: (a) re-experiencing, (b) hypersensitivity, vigilance, and arousal, (c) withdrawal and numbing, and (d) affective problems such as anger and aggression (Ehlers et al. 2004; Hart et al. 2008). Without regulation, the severity and debilitating effects of these symptoms can prevent the individual from processing cognitive impairments, maladaptive thoughts, feelings, and behaviors that maintain the trauma-related symptoms.

CM strategies can be learned and employed directly to address these symptoms. First, the skills of sensory awareness of bodily sensations acquired during the first 2 weeks are employed to deal with the most prominent cluster of symptoms: re-experiencing. The patient learns to use sensory awareness to develop subject–object differentiation, i.e., that he or she senses the sensory experiences as separate from himself or herself (Wells and Sembi 2004). The individual can then reduce over-identification with the bodily sensations during the re-experiencing of trauma.

After the individual de-identifies with the sensations, the individual is then encouraged to sustain attention in a non-judgmental, non-controlling way on a specific distressing sensation from among the hierarchy. The individual maintains the bodily relaxation triggered automatically by the even, smooth, and comfortable risings/fallings of the abdomen without conscious effort (see details above). Sustained attention is designed to inhibit distracters and habitual response patterns in order to facilitate prolonged exposure to the hierarchy of distressing sensations (Treanor 2011). Prolonged exposure is employed to know the details of the sensations as a means to acquire tolerance of the distracters that produce anxiety.

Both sensory awareness and sustained attention are carried out in a non-judgmental and non-controlling way to prevent reactive habitual responses. However, to engage in awareness and attention in a non-judgmental and non-controlling way, it is important to resolve any processing conflicts that arise. Awareness and sustained attention are higher cognitive processes that involve a number of perceptual and cognitive subtasks that need to be coordinated (Rueda et al. 2005). Clinical populations generally encounter difficulty coordinating these subtasks and it is critical that when coordinating problems arise they are addressed immediately. For instance, many individuals with PTSD may have difficulty in coordinating the tasks of sustaining attention while generating automatic even abdominal breathing

cycles, and without resolution, further training will be severely be compromised.

Periodical monitoring of one's performance is an integral part of CM training. This monitoring ensures rapid and accurate responses to the chosen tasks, that tasks are performed as instructed, and effective choices are made between alternative tasks. Finally, these tasks are employed to achieve the goals of the practice (Korenblum et al. 2007).

Phase II: Sessions 3 to 8

During the second phase, after cluster symptoms have been contained to a manageable level, the therapist and individual can proceed to work collaboratively with the primary hot spots. Generally, resistances will include negativistic, catastrophic thoughts, and extreme feelings of anxiety, guilt, and/or shame, etc. Avoidance behaviors to monitor include cognitive, affective, and behavioral resistances as well as recurrence of any of the cluster symptoms associated with PTSD (Foa et al. 2007). When any of the cluster symptoms recur, the intervention described in phase I is applied until the symptoms are managed.

The first step in treating the primary resistance is to identify the key event or situation that triggers the trauma. The therapist assists the individual in discovering the underlying main image associated with the trauma that triggers excessive anxiety and distress. Anxious individuals may report more than one image; therefore, it is critical to spend enough time methodically identifying the key image. Once the image is identified, such as the headlights of an oncoming car before impact, the individual is asked to recall and describe as much detail as he or she can remember of the image as well as the events before and after the event. A copy of the individual's initial narrative should be documented to serve as a recall baseline of the trauma.

Next, the individual is assisted with holding the image of the trigger (e.g., headlights) in his or her mind's eye as long as possible while periodically verbalizing the main negative and catastrophic thoughts, including varying distressful bodily sensations (Treanor 2011). At this point, individuals might react instantly with cluster symptoms. The identified symptoms are processed with CM strategies as instructed earlier. After successful regulation of cluster symptoms, catastrophic thoughts, extreme anxiety, and/or avoidant behavior may arise in response to continued exposure (Foa et al. 2007). When the individual responds with catastrophic thoughts such as, "I don't know how I will survive," the therapist helps the individual process the maladaptive thought. A set of three CBT interventions, Socratic questioning, evidence for and against, and behavioral experiments, are recommended to replace the catastrophic thought with a more rational thought.

Once the catastrophic thought is restructured, sustained attention is applied to the underlying image representative of the adaptive thought, while the individual verbalizes associated

thoughts and feelings triggered by the image. The objective of sustaining attention on a new realization, such as an adaptive thought, is to integrate it into the mental continuum through knowing the details of the image and its associated meanings (Lamrimpa 2011).

Next, the individual incorporates the restructured adaptive image and associated thoughts and feelings into the relevant place in the narrative. The daily reading of the increasingly modified narrative not only reduces anxiety, but also avoidance behavior as the individual becomes increasingly habituated to recalling greater details of the trauma (Robjant and Fazel 2010). When maladaptive thoughts, feelings, and behaviors recur in real time outside the sessions, the individual is reminded that these are expected and they, per se, are not the problem; the important thing is how the individual appraises and reacts to them.

After the integration of the adaptive thoughts and feelings into the narrative, the individual returns to the original image of the trigger (e.g., the headlights of the oncoming car) and verbalizes the most feared thoughts, feelings, and impulses associated with the image. At this point, the individual is assessed for signs of increased ability to sustain attention on the triggering image by identifying evidence of recall of greater details of the image and memories compared to the baseline responses. When negativistic thoughts, affective distress, or avoidant behaviors occur and interfere with the sustained attention, the two-step method of processing with CBT, and integrating the restructured, adaptive thought, feeling, or behavior into the narrative, is conducted as many times as needed.

When the individual is able to sustain attention for longer periods on the triggering image and there are signs of habituation, the individual is asked to relax the amount of mental and attentional resources allocated to the image and learn to consciously expand the breadth of awareness to the rest of the body.

Phase III: Sessions 9–12

By this phase, the individual has developed tolerance of the threatening image. During sessions 9–12, the therapist helps the individual to consciously relax and relinquish the mental effort and attention applied to the image. The individual learns to distribute attentional resources to awareness of the rest of the body while anchoring a part of the attention on the threatening image.

An individual's increased bodily awareness results in greater spatial flexibility. The therapist can then help the individual gradually become aware of specific distressing bodily sensations, anxiety-producing thoughts, feelings, and impulses. The individual can then detect and shift from one stimulus to the next and label and relinquish them. The objective is to increase orienting attention, discrimination, and labeling while remaining anchored on the primary threatening image.

The individual then identifies the most distressing bodily sensation or thought and engages in divided attention between the triggering image and the peripheral sensation in a non-judgmental and non-controlling way for extended periods. The process of maintaining non-judgmental and non-controlling awareness of the peripheral sensations or images, coupled with relaxation of the body by even abdominal breathing cycles, and the effects of successfully processing distressing bodily sensations and negativistic or catastrophic thoughts will help to reduce the intensity of the peripheral distressing sensations and catastrophic thoughts.

As the distressing symptoms decrease, the individual will become increasingly aware of the changing interaction between the triggering image and the sensations, thoughts, and feelings produced by peripheral anxiety (Analayo 2006). When additional memories associated with the trigger are recalled, the individual will notice increased anxiety-producing sensations, thoughts, and feelings. Conversely, if the anxiety-producing sensations, thoughts, or feelings increase, the image of the trigger is also affected. Changes will be acquired as the individual observes these interactions, experiential insight into moment-to-moment triggers, habitual reactions, and perceptual responses (cognitive, affective, and behavioral). The clinically relevant insights are then added to the relevant parts of the narrative.

In the final two sessions, the individual reviews and describes the entire narrative, including the recalled memories, and adaptive thoughts, feelings, and behaviors at least twice. In the very last session, progress in treatment is reviewed, and relapse prevention is practiced. The individual is recommended to return for maintenance sessions every 2 weeks for 3 months and once every month for 3 months thereafter.

Conclusions and Future Directions

In this paper, we aimed to critically analyze the current state of research on applying mindfulness to the treatment of PTSD, to identify the lack of a sufficient operationalization of the concept, and, in an attempt to remedy such, offer a definition drawn from the classic Buddhist teachings: classical mindfulness. Mindfulness is currently employed in a variety of contexts to treat PTSD, but the current research is diluted by a lack of specifics. In treating PTSD, mindfulness research correlates improvements in attention to improvements in symptoms, but the various and specific types of attention current versions of mindfulness aim to develop or improve remains muddled. For example, studies of the most popular form of mindfulness in psychological practice today, MBSR, are inconclusive in determining what specific type of attention is being trained. This also impacts the currently offered operationalized definitions of mindfulness, leaving them unclear as well. The current research remains unresolved as it varies greatly in the types of attention studied and presents with conflicting results. It remains ambiguous how mindfulness

reduces symptoms and, more specifically, how and what facets of attention it affects.

In noting this, a need for an accurate operationalization, including what specific attentional processes are targeted, was observed. In an attempt to respond, we offer CM, a definition drawn from the Buddhist text *Satipatthana-sutta*, and contend that it may be complimentary and easily integrated into PE, a widely known and effective treatment for PTSD. The *Satipatthana-sutta* text details a practice that involves the sequential acquisition of mindfulness of bodily sensations, feelings, thoughts, and mental objects (Analayo 2006). CM also aids in the development of refined perceptual and cognitive skills such as concurrent focal and broadening the breadth of attention in order to know internal and external experiences objectively so that maladaptive thoughts, feelings, and behaviors can give way to more adaptive ones (Rapgay and Bystrisky 2009). These skills can be a complimentary adjunct to PE and remain cost-free, accessible, and easily taught.

More directly, the term mindfulness, derived from the Pali word *sati*, means “to possess awareness, attention, and remembering” (Bodhi 2000). In CM training, *sati* is cultivated and refined in a step-by-step manner, to build and strengthen specific attentional faculties. This begins with focus on the breath followed by integration of other bodily sensations: an intentional exercise in selective and sustained attention. This practice is expanded sequentially to include thoughts, emotions, and behavior resulting in increased attentional control and this skill allows clients to adjust and improve their subjective experience and better manage their re-experiencing of trauma (e.g., flashbacks). Although PTSD was the central focus of the current paper due to the increased limitations among existing PTSD interventions and the lack of supported mindfulness-based interventions for PTSD, it is important to note the versatility of CM training which is also applicable to other types of anxiety disorders albeit with appropriate modifications. For instance, the central exposure component required in PTSD intervention would be less prominent for generalized anxiety disorder, but would place greater focus on various levels of distorted cognitions. Discussion of the various applications and modifications of CM for other anxiety disorders is beyond the scope of this current paper, but is encouraged.

Future research directions should also include an empirical investigation of the effectiveness of the proposed CM integrated with PE therapy 12-week protocol using a PTSD population sample initially, as well as PTSD treatment-resistant populations (e.g., dropouts, ineffective results, etc.). The literature may also benefit from comparing the efficacy and effectiveness of the integrated CM-PE protocol for PTSD treatment with studies utilizing traditional PE intervention in order to confirm specific areas in which CM may or may not supplement the current PE protocol. Also, future research would benefit from studying the effects of increased, sustained, and distributed attention training (according to CM) to general attention and acceptance training

(as found in alternative mindfulness interventions such as MBSR) in order to facilitate a more in-depth understanding of the functions and benefits of cultivating specific attentional skills, as well as determining which attentional processes would be most beneficial in the treatment of PTSD symptoms.

We admit that this paper serves only as the tip of the iceberg. Although it is helpful to have identified a need and responded with an appropriate effort, our claims could be greatly substantiated by empirical data. Now that specific attentional facets have been targeted, research could attempt to solidify the correlates noted before that had previously run the risk of inappropriate generalization. Multiple measures of selective and sustained attention exist and could be utilized to strengthen the argument that gains in these pieces of attentional control can result in an improved subjective experience or decrease in PTSD symptoms. These results would be more appropriate for generalization as they would rest on a refined operationalization of mindfulness that includes a direct indication of the attentional processes involved.

References

- American Psychological Association. (2000). *Diagnostic and statistical manual of mental disorders, DSM-IV-TR*. Washington D.C.: American Psychiatric Publishing, Inc.
- Amir, N., Najmi, S., Somyea, J., & Burns, M. (2010). Attention training in individual generalized social phobia: a randomized controlled trial. *Journal of Consulting and Clinical Psychology, 77*(5), 961–973.
- Analyo, B. (2011). Buddhist tradition (oral presentation) at International Congress Mindfulness. Hamburg University, Germany, August, 2011.
- Analyo, B. (2006). *Satipatthana: the direct path of realization*. Birmingham: Windhorse.
- Aupperle, R. L., Melrose, A. J., Stern, M. B., & Paulas, M. P. (2011). Executive function and PTSD: disengaging from trauma. *Neuropharmacology, 30*, 1–9.
- Baer, R. (2006). *Mindfulness-based treatment approaches: clinician's guide to evidence based and applications*. San Diego: Elsevier.
- Barlow, D. H. (1993). *Clinical handbook of psychological disorders: a step-by-step treatment manual*. New York: Guilford.
- Behar, E., DiMarco, I., Hekler, E. B., Mohlman, J., & Staples, A. M. (2009). Current theoretical models of generalized anxiety disorder (GAD): conceptual review and treatment implications. *Journal of Anxiety Disorders, 23*(8), 1011–1023.
- Bishop, S. C., Lau, M., Shapiro, S., Carlson, N. D., Carmody, J., Segal, Z. V., Abbey, S., Speca, M., Veiting, D., & Devina, G. (2004). Mindfulness: a proposed operational definition. *Clinical Psychology: Science and Practice, 11*(3), 230–241.
- Black, D. S. (2011). A brief definition of mindfulness. *MindfulnessResearchGuide*. From <http://www.mindfulexperience.org>. Accessed 3 Dec 2013.
- Bodhi, B. (2000). *A comprehensive manual of Adhidhamma*. Seattle: BPS Pariyatti.
- Bodhi, B. (2011). What does mindfulness really mean? A canonical perspective. *Contemporary Buddhism, 12*, 19–21. doi:10.1080/14639947.2011.564813.
- Bradley, R., Greene, J., Russ, E., Dutra, L., & Westen, D. (2005). A multidimensional meta-analysis of psychotherapy for PTSD. *The American Journal of Psychiatry, 162*(2), 214–227. Retrieved from EBSCOhost.
- Chard, K. M. (2005). An evaluation of cognitive processing therapy for the treatment of posttraumatic stress disorder related to childhood sexual abuse. *Journal of Consulting and Clinical Psychology, 73*(5), 965–971. doi:10.1037/0022-006X.73.5.965.
- Chiesa, A., & Malinowski, P. (2011). Mindfulness-based approaches: are they all the same? *Journal of Clinical Psychology, 67*(4), 404–424.
- Committee on Treatment of Post-traumatic Stress Disorder Institute of Medicine [IOM]. (2008). *Treatment of post-traumatic stress disorder: an assessment of the evidence*. Washington: National Academies Press.
- Ehlers, A., Clark, D., Hackmann, A., McManus, F., Fennell, M., Herbert, C., & Mayou, R. (2003). A randomized controlled trial of cognitive therapy, a self-help booklet, and repeated assessments as early interventions for posttraumatic stress disorder. *Archives of General Psychiatry, 60*(10), 1024–1032.
- Ehlers, A., Hackmann, A., & Michael, T. (2004). Intrusive re-experiencing in post-traumatic stress disorder: phenomenology, theory, and therapy. *Memory, 12*, 403–415. doi:10.1080/09658210444000025.
- Eysenck, M. N., Derakshan, N., Santos, R., & Calvo, M. G. (2007). Anxiety and cognitive performance: attentional control theory. *Emotion, 7*(2), 336–353.
- Foa, E., Dancu, C., Hembree, E., Jaycox, L., Meadows, E., & Street, G. (1999). A comparison of exposure therapy, stress inoculation training, and their combination for reducing posttraumatic stress disorder in female assault victims. *Journal of Consulting and Clinical Psychology, 67*(2), 194–200.
- Foa, E. B., Hembree, E. A., & Rothbaum, B. O. (2007). *Prolonged exposure therapy for PTSD, emotional processing of traumatic experiences: therapist guide*. New York: Oxford University Press.
- Follette, V., Palm, K. M., & Pearson, A. N. (2006). Mindfulness and trauma: implications for treatment. *Journal of Rational-Emotive & Cognitive-Behavioral Therapy, 24*(1), 45–61.
- Follette, F. M., & Vijay, A. (2009). Mindfulness for trauma and post-traumatic stress disorder. In F. Didonna (Ed.), *Clinical handbook of mindfulness* (pp. 299–317). New York: Springer. doi:10.1007/978-0-387-09593-6.
- Fox, E., & Riconscente, M. (2008). Metacognition and self-regulation in James, Piaget, and Vygotsky. *Educational Psychology Review, 20*(4), 373–389.
- Friedman, M., Marmar, C., Baker, D., Sikes, C., & Farfel, G. (2007). Randomized, double-blind comparison of sertraline and placebo for posttraumatic stress disorder in a Department of Veteran's Affairs setting. *The Journal of Clinical Psychiatry, 68*(5), 711–720.
- Gable, P. A., & Harmon-Jones, E. (2012). Reducing attentional capture of emotion by broadening attention: increased global attention reduces early electrophysiological responses to negative stimuli. *Biological Psychology, 90*, 150–153.
- Garland, E., & Gaylord, S. (2009). Envisioning a future contemplative science of mindfulness: fruitful methods and new content for the next wave of research. *Complementary Health Practice Review, 14*(1), 3–9.
- Hart, J., Kimbrell, T., Fauver, P., Cherry, B. J., Pitcock, J., Booe, L. Q., Tilman, G., & Freeman, T. W. (2008). Cognitive dysfunctions associated with PTSD: evidence from World War II prisoners of war. *The Journal of Neuropsychiatry and Clinical Neurosciences, 20*, 309–316.
- Hayes, S. C., Strosahl, K. D., & Wilson, K. G. (1999). *Acceptance and commitment therapy: an experiential approach to behavior change*. New York: Guilford.
- Jatzko, A., Rothenhofer, S., Schmitt, A., Gaser, C., Demirakca, T., Weber-Fahr, W., Magnotta, V., & Braus, D. F. (2006). Hippocampal volume in chronic posttraumatic stress disorder: MRI study using two different evaluation methods. *Journal of Affective Disorders, 94*, 121–126.
- Kabat-Zinn, J. (1990). *Full catastrophe living: using the wisdom of your body and mind to face stress, pain, and illness*. New York: Dell.
- Kabat-Zinn, J. (1994). *Wherever you go, there you are: mindfulness meditation in everyday life*. New York: Hyperion.

- Kabat-Zinn, J., Mansion, A. O., Kristeller, J., Peterson, L. G., & Fletcher, K. E. (1992). Effectiveness of a mindfulness-based stress reduction program in the treatment of anxiety disorders. *American Journal of Psychiatry*, *149*(7), 936–943.
- Karlin, B. E., Ruzek, J. I., Chard, K. M., Eftekhari, A., Monson, C. M., Hembree, E. A., & Foa, E. B. (2010). Dissemination of evidence-based psychological treatments for posttraumatic stress disorder in the Veterans Health Administration. *Journal of Traumatic Stress*, *23*(6), 663–673. doi:10.1002/jts.20588.
- Kearney, D. J., McDermott, K., Malte, C., Martinez, M., & Simpson, T. L. (2012). Association of participation in a mindfulness program with measures of PTSD, depression and quality of life in a veteran sample. *Journal of Clinical Psychology*, *68*, 101–116. doi:10.1002/jclp.20853.
- Kessler, R., Sonnega, A., Bromet, E., Hughes, M., & Nelson, C. B. (1995). Posttraumatic stress disorder in the national comorbidity survey. *Archives of General Psychiatry*, *52*, 1048–1060.
- Korenblum, C. B., Chen, S. X., Manassis, K., & Schachar, R. J. (2007). Performance monitoring and response inhibition in anxiety disorders with and without ADHD. *Depression and Anxiety*, *24*(4), 227–232.
- Lamrimpa, G. (1992). *Calming the mind: Tibetan buddhist teachings on the cultivation of meditative quiescence*. Ithaca: Snow Lion.
- Lamrimpa, G. (2011). *How to practice samatha meditation*. Boston: Snow Lion.
- Lavie, N., Hirst, A., De Fockert, J. W., & Viding, E. (2004). Load theory of selective attention and cognitive control. *Journal of Experimental Psychology: General*, *133*(3), 339–354.
- Leahy, R. L. (2003). *Cognitive therapy techniques: a practitioner's guide*. New York: Guilford.
- Linehan, M. (1993). *Cognitive-behavioral treatment for borderline personality disorder*. New York: Guilford.
- Lutz, A., Slagter, H. A., Dunne, J. D., & Davidson, R. J. (2008). Attention regulation and monitoring in meditation. *Trends in Cognitive Sciences*, *12*(4), 163–169.
- Mackworth, J. F. (1968). Vigilance, arousal, and habituation. *Psychological Review*, *75*, 308–322.
- McLay, R. N., Wood, D. P., Webb-Murphy, J. A., Spira, J. L., Wiederhold, M. D., Pyne, J. M., & Wiederhold, B. K. (2011). A randomized, controlled trial of virtual reality-graded exposure therapy for post-traumatic stress disorder in active duty service members with combat-related post-traumatic stress disorder. *Cyberpsychology, Behavior and Social Networking*, *14*(4), 223–229. doi:10.1089/cyber.2011.0003.
- Owens, G. P., Walter, K. H., Chard, K. M., & Davis, P. A. (2012). Changes in mindfulness skills and treatment response among veterans in residential PTSD treatment. *Psychological Trauma: Theory, Research, Practice, and Policy*, *4*(2), 221–228. doi:10.1037/a0024251.
- Pineles, S. L., Shipper, J. C., Mostoufi, S. M., Amramovitz, S. M., & Yovel, I. (2009). Attentional biases in PTSD: more evidence for interference. *Behavior Research and Therapy*, *47*(12), 1050–1057.
- Ponniah, K., & Hollon, S. D. (2009). Empirically supported psychological treatments for adult acute stress disorder and posttraumatic stress disorder: a review. *Depression and Anxiety*, *26*(12), 1086–1109. doi:10.1002/da.20635.
- Ramel, W., Goldin, P. R., Carmona, P. E., & McQuaid, J. R. (2004). The effects of mindfulness meditation on cognitive processes and affect in patients with past depression. *Cognitive Therapy and Research*, *28*(4), 433–455.
- Rapgay, L., & Bystritsky, A. (2009). Classical mindfulness: an introduction to its theory and practice for clinical application. *Annals of The New York Academy Of Sciences*, *1172*148–162.
- Rapgay, L., Bystritsky, A., Dafer, R. E., & Spearman, M. (2011). New strategies for combining mindfulness with integrative cognitive behavioral therapy for the treatment of generalized anxiety disorder. *Journal of Rational-Emotive & Cognitive Behavior Therapy*, *29*(2), 92–119. doi:10.1007/s10942-009-0095-z.
- Rauch, S. M., Defever, E., Favorite, T., Duroe, A., Garrity, C., Martis, B., & Liberzon, I. (2009). Prolonged exposure for PTSD in a Veterans Health Administration PTSD clinic. *Journal of Traumatic Stress*, *22*(1), 60–64.
- Resick, P. A., Nishith, P., Weaver, T. L., Astin, M. C., & Feuer, C. A. (2002). A comparison of cognitive-processing therapy with prolonged exposure and a waiting condition for the treatment of chronic posttraumatic stress disorder in female rape victims. *Journal of Consulting and Clinical Psychology*, *70*(4), 867–879.
- Robjant, K., & Fazel, M. (2010). The emerging evidence for narrative exposure therapy: a review. *Clinical Psychology Review*, *30*(8), 1030–1039.
- Rowe, G. G., Hirsh, J. B., & Anderson, A. K. (2007). Positive affect increases the breadth of attentional selection. *Proceedings of the National Academy of Sciences of the United States of America*, *104*(1), 383–388.
- Rueda, M. R., Posner, M. I., & Rothbart, M. K. (2005). The development of executive function: contributions to the emergence of self-regulation. *Developmental Neuropsychology*, *28*, 573–594.
- Sayadaw, P. T. (2010). *Knowing and seeing* (4th ed.). Singapore: CreateSpace Independent Publishing Platform, Pa-Auk Meditation Centre.
- Schnurr, P. P., Friedman, M. J., Engel, C. C., Foa, E. B., Shea, M. T., Chow, B. K., Resick, P. A., Thurston, V., Orsillo, S. M., Haug, R., Turner, C., & Bernardy, N. (2007). Cognitive behavioral therapy for posttraumatic stress disorder in women: a randomized controlled trial. *JAMA: The Journal of the American Medical Association*, *297*(8), 820–830.
- Schottenbauer, M. A., Glass, C. R., Arnkoff, D. B., Tendick, V., & Hafter Gray, S. (2008). Nonresponse and dropout rates in outcome studies on PTSD: review and methodological considerations. *Psychiatry: Interpersonal & Biological Processes*, *71*(2), 134–168.
- Segal, Z. V., Williams, J. M., & Teasdale, J. D. (2004). Mindfulness-based cognitive therapy. In S. C. Hayes, V. M. Follete, & M. M. Linehan (Eds.), *Mindfulness and acceptance*. New York: Guilford.
- Seli, P., Cheyne, J. A., Barton, K. R., & Smilek, D. (2012). Consistency of sustained attention across modalities: comparing visual and auditory versions of the SART. *Canadian Journal of Experimental Psychology*, *66*, 44–50. doi:10.1037/a0025111.
- Sharpless, B. A., & Barber, J. P. (2011). A clinician's guide to PTSD treatments for returning veterans. *Professional Psychology: Research and Practice*, *42*(1), 8–15. doi:10.1037/a0022351.
- Stein, D., Davidson, J., Seedat, S., & Beebe, K. (2003). Paroxetine in the treatment of post-traumatic stress disorder: pooled analysis of placebo-controlled studies. *Expert Opinion on Pharmacotherapy*, *4*(10), 1829–1838.
- Tarrier, N., Pilgrim, H., Sommerfield, C., Faragher, B., Reynolds, M., Graham, E., & Barrowclough, C. (1999). A randomized trial of cognitive therapy and imaginal exposure in the treatment of chronic posttraumatic stress disorder. *Journal of Consulting and Clinical Psychology*, *67*(1), 13–18.
- Teasdale, J. D., Segal, Z. V., William, J. M., Ridgeway, V. A., Soulsky, J. M., & Lau, M. A. (2000). Prevention of relapse/recurrence in major depression by mindfulness based cognitive therapy. *Journal of Consulting and Clinical Psychology*, *68*(4), 615–623.
- Thanissaro Bhikkhu. (1995). Satipatthana sutta: frames of reference (Translation) (MN 10). <http://www.accesstoinsight.org/tipitaka/mn/mn.did.than.html>. Accessed 3 Dec 2012.
- Thera, S. (1998). *The way of mindfulness: the Satipatthana Sutta and its commentary* (p 144). Kandy: Buddhist Publication Society.
- Tompsonski, P. D., & Tinsley, V. F. (1996). Effects of memory demand and motivation on sustained attention in young and older adults. *The American Journal of Psychology*, *109*(2), 187–204.
- Treanor, M. (2011). The potential impact of mindfulness as exposure and extinction learning in anxiety disorders. *Clinical Psychology Review*, *4*, 617–675.

- Tuerk, P. W., Yoder, M., Grubaugh, A., Myrick, H., Hamner, M., & Acierno, R. (2011). Prolonged exposure therapy for combat-related posttraumatic stress disorder: an examination of treatment effectiveness for veterans of the wars in Afghanistan and Iraq. *Journal of Anxiety Disorders, 25*(3), 397–403. doi:10.1016/j.janxdis.2010.11.002.
- United States Department of Defense for Veteran Affairs [VA/DoD] (2010). *Clinical practice guideline: management of post-traumatic stress disorder summary*. Retrieved from http://www.healthquality.va.gov/ptsd/ptsd-sum_2010a.pdf. Accessed 9 Oct 2011.
- Vakili, Y., & Fada, L. (2006). The effectiveness of the metacognitive model in treating a case of post-traumatic stress disorder. *Iran Journal of Psychiatry, 1*, 169–171.
- Van der Kolk, B., Spinazzola, J., Blaustein, M., Hopper, J., Hopper, E., Korn, D., & Simpson, W. (2007). A randomized clinical trial of eye movement desensitization and reprocessing (EMDR), fluoxetine, and pill placebo in the treatment of posttraumatic stress disorder: treatment effects and long-term maintenance. *The Journal Of Clinical Psychiatry, 68*(1), 37–46.
- Vujanovic, A. A., Niles, B., Pietrefesa, A., Potter, C. M., & Schmertz, S. K. (2010). *Potential of mindfulness in treating trauma reactions*. From United States Department of Veteran Affairs—National Center for PTSD: <http://www.ptsd.va.gov/professional/pages/mindful-PTSD.asp>. Accessed 16 Jan 2012.
- Vujanovic, A. A., Niles, B., Pietrefesa, A., Schmertz, S. K., & Potter, C. M. (2011). Mindfulness in the treatment of posttraumatic stress disorder among military veterans. *Professional Psychology: Research and Practice, 42*(1), 24–31. doi:10.1037/a0022272.
- Vujanovic, A. A., Youngwirth, N. E., Johnson, K. A., & Zvolensky, M. J. (2009). Mindfulness-based acceptance and posttraumatic stress symptoms among trauma-exposed adults without axis I psychopathology. *Journal of Anxiety Disorders, 23*(2), 297–303.
- Wagner, A., & Linehan, M. M. (2006). Applications of dialectical behavior therapy to posttraumatic stress disorder and related problems. In V. M. Follette & J. I. Ruzek (Eds.), *Cognitive-behavioral therapies for trauma* (2nd ed., pp. 117–145). New York: Guilford.
- Wallace, B. A. (1999). The Buddhist tradition of samatha: methods for refining and examining consciousness. *Journal of Consciousness Studies, 6*(2–3), 175–187.
- Walser, R. D., & Westrup, D. (2007). *Acceptance & commitment therapy for the treatment of post-traumatic stress disorder & trauma-related problems*. Oakland: New Harbinger.
- Wiederhold, B., & Wiederhold, M. (2010). Virtual reality treatment of posttraumatic stress disorder due to motor vehicle accident. *Cyberpsychology, Behavior and Social Networking, 13*(1), 21–27. doi:10.1089/cyber.2009.0394.
- Wells, A., & Sembi, S. (2004). Metacognitive therapy for PTSD: a preliminary investigation of a new brief treatment. *Journal of Behavior Therapy and Experimental Psychiatry, 35*(4), 307–318.
- Zvolensky, M. J., Bernstein, A., & Vujanovic, A. A. (2011). *Distress tolerance: theory, research, and clinical applications*. New York: Guilford.