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Exploring The Relationship Between Facets of Mindfulness and Emotion Regulatory Flexibility

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ABSTRACT

EXPLORING THE RELATIONSHIP BETWEEN FACETS OF MINDFULNESS AND EMOTION REGULATORY FLEXIBILITY

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Emotion dysregulation can often be attributed to an inability to employ a range of regulatory strategies across varying stressful situations (i.e., regulatory flexibility). Therefore, it remains clinically relevant to determine the mechanisms that facilitate regulatory flexibility. Although mindfulness and regulatory flexibility have been linked, relations between mindfulness facets and regulatory flexibility have not yet been considered. This study aimed to determine which facets of self-reported trait mindfulness are related to regulatory choice flexibility. Using a previously validated performance-based emotion regulation choice paradigm, undergraduates (N = 78; 62.8% female; M_{age} = 19.82, SD = 2.03) chose to use either reappraisal or distraction in response to negative emotional images of low- and high-intensity. Consistent with previous research, use of distraction was significantly affected by trial intensity, $F(1, 77) = 286.09$, $p < .001$, $\eta_p^2 = .79$, such that participants demonstrated a relative preference for reappraisal across low-intensity trials (76.84%) and distraction across high-intensity trials (63.25%). Additionally, controlling for the other mindfulness facets, a regression analysis revealed that the only facet significantly associated with regulatory choice flexibility was nonjudging of inner experience ($\beta = -.40$, $p < .01$). The unexpected negative directionality indicates this facet is associated with less regulatory flexibility.

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EXPLORING THE RELATIONSHIP BETWEEN FACETS OF MINDFULNESS AND EMOTION REGULATORY FLEXIBILITY

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CHAPTER 1

INTRODUCTION

Many psychopathologies, including the mood and anxiety disorders, involve some degree of emotion dysregulation (Aldao, Nolen-Hoeksema, Schweizer, 2010; Cisler, Olatunji, Feldner, & Forsyth, 2010; Ehring, Tuschen-Caffier, Schnulle, Fischer, & Gross, 2010). Furthermore, research indicates that the emotion dysregulation seen across disorders is attributable to a deficit in emotion regulatory flexibility, or the ability to employ a range of emotion regulation strategies across varying stressful situations (Bonanno & Burton, 2013; Bonanno, Pat-Horenczyk, & Noll, 2011; Gupta & Bonanno, 2011; Kashdan & Rottenberg, 2010; Levy-Gigi et al., 2016). Therefore, it remains clinically relevant to determine the mechanisms that facilitate emotion regulatory flexibility. Among potential mechanisms, mindfulness is a notable candidate.

Mindfulness is the act of attending to each moment, feeling, thought, and sensation as it occurs in the present moment in a nonjudgmental manner (Kabat-Zinn, 1994). Higher levels of mindfulness have been associated with improved emotion regulation (Chambers, Gullone, & Allen, 2009; Roemer et al., 2009). Additionally, mindfulness has been linked to greater cognitive flexibility (Anicha, Ode, Moeller, & Robinson, 2012; Moore & Malinowski, 2009), a construct theoretically consistent with emotion regulatory flexibility (Shapiro, Carlson, Astin, & Freedman, 2006). This enhancement in cognitive flexibility is thought to be fostered through accompanying processes associated with mindfulness, which include decentering, improvements in attention, reduced emotional reactivity, and enhanced affect labeling (Shapiro et al., 2006).

Because mindfulness can be conceptualized as a multifaceted construct comprised of these processes (Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006; Baer et al., 2008), this study aims to determine which facets of self-reported trait mindfulness are predictive of emotion regulatory flexibility using the performance-based emotion regulation choice paradigm (Sheppes, Scheibe, Suri, & Gross, 2011).

This study investigates whether mindfulness confers its evidenced emotion regulation benefits by promoting emotion regulatory flexibility. First, emotion regulation is defined, and Gross's (1998b) seminal process model of emotion regulation is presented, as well as its influence on the field of emotion regulation research. Second, emotion regulatory flexibility is defined, and the theory and empirical evidence supporting it are discussed. Third, the mechanisms of emotion regulatory flexibility are demonstrated, and the behavioral paradigm used in this study to measure emotion regulatory flexibility is introduced and its development discussed. Fourth, mindfulness is defined, and an overview of its association with emotion regulation and cognitive flexibility is reviewed. Finally, the facets of mindfulness are defined, and their relationship with emotion regulatory flexibility is examined as a potential mechanism underlying the positive effects of mindfulness on emotion regulation.

Emotion Regulation

It is well documented that many forms of psychopathology involve some degree of emotion dysregulation (Aldao et al., 2010; Berking & Wupperman, 2012), including anxiety disorders (Cisler et al., 2010), depression (Ehring et al., 2010), posttraumatic stress disorder (PTSD; Cloitre, Miranda, Stovall-McClough, & Han, 2005; Ehring & Quack, 2010), and

borderline personality disorder (BPD; Linehan, 1993; Lynch, Trost, Salsman, & Linehan, 2007). Emotion regulation can be defined as the conscious or unconscious strategies employed by an individual to influence the nature of their emotions (Gross, 1998b). These strategies affect which emotions one has, when they occur, and the experience and expression of these emotions. Gross's (1998b; 2001; 2002) process model of emotion regulation distinguishes between different emotion regulation strategies based on when they are employed during the developing emotional response, also known as the emotion generative process. In the process model, the effectiveness of different strategies varies and is contingent on which stage of processing for which they are utilized. In this study, the effectiveness of a regulation strategy refers to its success at emotion down-regulation or decreasing the intensity of emotion.

Emotion regulation strategies may influence emotions at five points during the emotion generative process: situation selection, situation modification, attention deployment, cognitive change, and response modulation. The first four processes reflect strategies that modulate one's emotions before they fully develop (antecedent-focused strategies), whereas the fifth process represents strategies that modulate emotions after they have already begun to develop (response-focused strategies). Because antecedent-focused strategies intervene before an emotion has peaked in its intensity, they are considered more effective than response-focused strategies (Gross, 1998b; 2001; 2002).

The first possible antecedent-focused strategy may occur during situation selection. Strategies employed at this stage regulate emotions through the engagement with or avoidance of certain places, people, or things (Gross, 2002). For instance, a student may decide to go to a restaurant with friends rather than continue filling out applications for graduate school. Once the

situation has been selected, emotions can be further regulated through situation modification. This may occur if, while at the restaurant, a friend asks about how applications are going, and the student redirects the conversation to further avoid talking about the stressor. Perhaps after he or she has changed the subject, other friends continue talking about their applications among themselves, and the student focuses instead on the basketball game playing on television. This is an emotion regulation strategy known as distraction and reflects regulation through attention deployment, or which aspect of the situation one directs attention toward. After having chosen which aspect of the situation to focus on, cognitive change entails assigning one of several potential meanings to that aspect to modify its emotional impact, a regulatory strategy known as cognitive reappraisal. For example, rather than catastrophizing over the potential of being rejected from a top college, the student can reappraise the situation by reminding his or herself that it is a competitive process and being rejected is not a reflection of his or her self-worth. Last, response modulation represents a specific response-focused strategy (Gross, 1998b), such as suppression. A form of suppression might be counting the ceiling tiles in the restaurant to ignore feelings of anxiety or worry after his or her friends talk about which schools did not accept them.

Informed by Gross's process model, a myriad of studies has compared the differential effects of an antecedent-focused strategy (i.e., reappraisal) to a response-focused strategy (i.e., suppression) on various outcomes, including affect, well-being, relationships, and physiological responding, in an effort to elucidate how these different strategies regulate emotion at different points of the emotion generative process (Gross, 1998a, 2002; Gross & John, 2003). Results largely indicated that reappraisal was a more effective strategy than suppression (John & Gross,

2004; Richards & Gross, 2000; Roberts, Levenson, & Gross, 2008; Srivastava, Tamir, McGonigal, John, & Gross, 2009).

In one study, participants viewed a short film of an arm amputation designed to elicit disgust (Gross, 1998a, 2002). Participants were given instructions to either think about the film in such a way that they did not feel anything (reappraise), to hide their emotional responses (suppress), or to just watch the film (control). Compared to suppression, reappraisal led to decreases in disgust experience, had no impact on memory (suggesting low consumption of cognitive resources), and resulted in less physiological responding (Gross; 1998a, 2002). Furthermore, Gross and John (2003) found that habitually reappraising positive and negative emotions in everyday life resulted in fewer depressive symptoms, greater life satisfaction, optimism, and self-esteem. Consistent with the process model, these findings suggest that antecedent-focused strategies are generally more effective and adaptive than response-focused strategies across situations. However, this perspective fails to consider the unique demands of different situations. Evidence now suggests that the ability to flexibly employ a variety of emotion regulation strategies across varying situations promotes adaptability (Aldwin, 1994; Barrett & Gross, 2001; Bonanno, Papa, Lalande, Westphal, & Coifman, 2004; Compas, Malcarne, & Fondacaro, 1988; Troy & Mauss, 2011).

Emotion Regulatory Flexibility

The previous perspective that one type of emotion regulation strategy is uniformly adaptive or maladaptive was termed the fallacy of uniform efficacy by Bonanno and Burton (2013). They contend that, because emotional experiences and situations are so dynamic and

nuanced, rigidity in regulatory strategies may be neither pragmatic nor healthy. This is consistent with evidence that suggests the mechanisms underlying emotion dysregulation involve inflexibly responding to situations of varying intensity (Bonanno et al., 2011; Gupta & Bonanno, 2011; Kashdan & Rottenberg, 2010; Levy-Gigi et al., 2016; Troy & Mauss, 2011). Instead, Bonanno and Burton (2013) posit that an adaptive regulatory profile entails the ability to employ a range of emotion regulation strategies across varying situations. They define this construct as regulatory flexibility and propose three critical sequential components that differ across individuals – sensitivity to context, repertoire of regulatory strategies, and responsiveness to feedback.

Sensitivity to context is the first component of regulatory flexibility and involves an evaluation of the stressor situation that ultimately determines which regulatory strategy is initially employed. Evaluation of the environment provides important information, such as the demands and opportunities of the stressor situation, that in turn facilitates the use of an effective regulatory strategy appropriately suited for that situation. However, individuals will vary in their appraisals of a situation and will not always employ the best strategy (an issue addressed by the final component). Nonetheless, it is still necessary to have access to different strategies, which is the second component of regulatory flexibility (Bonanno & Burton, 2013).

The ability to employ different regulatory strategies can be characterized as a repertoire, and it can be assessed by measuring the size of the repertoire, temporal variability, and categorical variability (Bonanno & Burton, 2013). The size of one's repertoire refers to the number of strategies available to use in the service of the regulation of emotion. Research suggests that having a larger repertoire of emotion regulation strategies leads to lower levels of

distress as compared to individuals who report having fewer strategies (Lam & McBride-Chang, 2007; Orcutt, Bonanno, Hannan, & Miron, 2014). Temporal variability reflects how the use of these strategies change over time and across stressor situations (Bonanno & Burton, 2013), which appears equally important for buffering distress (Cheng, 2001). For instance, students who were able to adjust their coping behavior before and after a stressful examination reported lower levels of stress relative to students who did not demonstrate variability in coping behavior (Gintner, West, & Zarski, 1989). Categorical variability measures the extent to which an individual can employ a variety of strategies (Bonanno & Burton, 2013). Findings support that the use of a greater range of strategies predicts lower levels of depression, anxiety, and posttraumatic stress (Bonanno et al., 2011; Lougheed & Hollenstein, 2012).

The last component of regulatory flexibility is responsiveness to feedback (Bonanno & Burton, 2013). As previously mentioned, an individual may not accurately appraise a stressor, which may result in employing an emotion regulation strategy that is incompatible with the stressor. Therefore, monitoring the efficacy of a strategy is important for the purposes of stopping, maintaining, adjusting or changing the strategy entirely (Bonanno & Burton, 2013; Kalisch, 2009; Paret et al., 2011). Monitoring occurs through sensitivity to both internal (e.g., heart rate) and external (e.g., social interactions) feedback, which have demonstrated links to emotion regulation (Coan, Schaefer, & Davidson, 2006; Eisenberger, Lieberman, & Williams, 2003; Füstös, Gramann, Herbert, & Pollatos, 2013; Kross, Berman, Mischel, Smith, & Wager, 2011).

The success of all three components is contingent on individual differences in his or her ability to execute them (Bonanno & Burton, 2013). Inaccurately appraising a situation during the

initial sensitivity to context stage may result in utilizing an ineffective strategy. Furthermore, responsiveness to feedback is directly affected by repertoire. For instance, while monitoring feedback, the individual may realize that the strategy is not working but can only implement an alternative strategy if one is at his or her disposal. Thus, healthy adjustment is dependent on the individual's competence in these three components (Bonanno & Burton, 2013). For example, Bonanno and Burton (2013) described a woman with a fear of flying who, due to career obligations, was required to fly regularly. Since she highly valued her job, she was resolved to challenge and overcome her anxiety rather than allow it to hinder her ambitions. During the end of one flight, the airplane suddenly shook with extreme turbulence. A flight attendant instructed passengers to return to their seats and fasten their seatbelts. Although the woman knew that such a response from the flight crew was typical and precautionary, she was certain the flight attendant sounded afraid, and she started to become aware of her own mounting anxiety. In accordance with the first stage of the regulatory flexibility model (i.e., contextual sensitivity), she realized the need to modulate her anxiety. Recalling her motivation to master her fear, she elected to use reappraisal, one regulatory strategy within her repertoire. She employed reappraisal during the repertoire stage by assuring herself that turbulence was extremely common, that the odds of a plane crash were exceedingly small, and that her situation would soon return to normal. While monitoring her internal responses during the feedback stage, she realized that this strategy was unsuccessful in ameliorating her anxiety. She startled with each bump in the plane and had been feverishly observing the other passengers to confirm her worries. It became obvious that her attempts at reappraisal had not helped, leading her to try a new strategy. In contrast to reappraisal, she implemented a disengaging strategy to distract herself by

perusing the in-flight magazine, various advertisements, and product descriptions. She noticed that her anxiety dissipated, and, consequently, maintained the active use of distraction (Bonanno & Burton, 2013).

This example emphasizes the importance of context and feedback in regulatory flexibility. It captures how regulatory flexibility requires a diversity of strategies as well as the constant attendance and responsiveness to shifting situational demands. The fluctuating demands of a stressor necessitate a multifaceted response for adaptive functioning, which is the essence of the regulatory flexibility framework (Bonanno & Burton, 2013). Many other researchers recognize the importance of being flexible in one's regulatory strategies to meet different contextual demands (Aldwin, 1994; Barrett & Gross, 2001; Bonanno, 2001, 2005; Bonanno et al., 2004; Cole, Martin, & Dennis, 2004; Compas et al., 1988; Gratz & Roemer, 2004; Kashdan & Rottenberg, 2010; Thompson, 1994; Troy & Mauss, 2011). Despite this widely held perspective, little is known about the actual emotion regulatory choices people make across situations of varying intensity (Sheppes et al., 2011).

Stages of Processing

To better understand the mechanisms underlying emotion regulatory flexibility, Sheppes and Gross (2011) reconsidered Gross' (1998b, 2001) earlier process model of emotion regulation, which states that the effectiveness of regulatory strategies depends on when they are employed during the emotion-generative process. Sheppes and Gross (2011) instead suggest that timing, albeit critical for some strategies, might be irrelevant for others. Their model draws from information processing theories, which contend that people's limited cognitive capacity to

perform mental operations engenders competition between various sources of information for determining the final behavioral response (Pashler, 1998; Sheppes & Gross, 2011; Sheppes et al., 2014). In the context of emotion regulation, the information sources in competition with each other are the emotion-generative process (i.e., emotional intensity) and the emotion-regulatory process (i.e., regulation strategies). These different sources of information compete at two major information processing stages, the early stage, where attentional selection processing occurs, and the late stage, where semantic meaning processing occurs (Hubner, Steinhauser, & Lehle, 2010; Johnston & Heinz, 1978; Pashler, 1998; Sheppes & Gross, 2011).

In the early stage, incoming perceptual information competes to capture selective attention (Sheppes & Gross, 2011; Sheppes et al. 2011). A filtering mechanism determines which of the incoming stimuli are blocked and which progress to the next stage of processing where semantic evaluation occurs. Minimal cognitive effort is required at this stage for selecting the focal stimuli because information has not yet been represented in working memory. Information that has gained access to the late stage of processing is provided semantic meaning and then competes with other sources of information to affect behavior (Sheppes et al., 2011). Given that more information is collected about the incoming stimuli during the late stage, resolution of conflict between competing sources of information requires more cognitive resources (Johnston & Heinz, 1978; Sheppes & Gross, 2011). Whereas regulatory strategies employed during the early stage are referred to as early selection strategies, regulatory strategies employed during the late stage are referred to as late selection strategies (Sheppes & Gross, 2011).

Sheppes and Gross (2011) argue that, since early selection strategies occur prior to meaning processing, they can replace any current and incoming emotional information with little

effort and are less affected by the degree of emotional intensity. Conversely, late selection strategies, which occur after emotional processing, require greater effort to modify the current and incoming emotional information, and are more affected by the degree of emotional intensity. Therefore, late selection strategies would be more effective for emotion regulation in low- rather than high-intensity emotional situations. Conversely, early selection strategies would be more effective than late selection strategies in high-intensity emotional situations. They refer to this as the process-specific timing hypothesis and explore the use of distraction (early selection strategy) and reappraisal (late selection strategy) in this model (Sheppes & Gross, 2011).

Distraction and reappraisal are recognized as effective emotion regulation strategies (McRae et al., 2010). In Gross' (1998b, 2001) process model, distraction and reappraisal are considered antecedent-focused strategies (occurring during attention deployment and cognitive change, respectively). Interestingly, Sheppes and Gross's (2011) focus on the difference between distraction and reappraisal creates finer distinctions within the antecedent-focused category. The following section reviews research on the use of distraction and reappraisal under varying emotional intensities to demonstrate the mechanisms of the process-specific timing hypothesis.

Distraction and Reappraisal

The use of distraction entails redirecting attention away from the emotional information and producing or focusing on unrelated, neutral content (e.g., thinking about driving to work; Sheppes & Gross, 2011; Van Dillen & Koole, 2007). Because the distraction is independent of the emotional situation, it is not in conflict with the incoming emotional information and can, therefore, effectively replace it with neutral information. The neutral information then competes

with incoming emotional information during the early stage, preventing the stimulus' affective meaning from being processed (Sheppes & Gross, 2011). To illustrate this process, imagine someone watching a movie as a highly disturbing scene unfolds. As the trajectory of the scene becomes clear, he or she might begin thinking about what to cook for dinner later. Toward this end, the incoming, distressful information about the disturbing scene are replaced by the neutral thoughts of cooking dinner at home. Replacing the emotional information with the neutral information prevents any affective processing of the movie scene.

By contrast, cognitive reappraisal involves attributing one of several potential meanings to a situation to modify its emotional impact (Gross, 1998b). During reappraisal, the emotional representation is reinterpreted. However, the new interpretation depends on the initial emotional representation that is being altered. This creates a conflict between the emotion-generative and emotion-regulation processes by requiring that the emotional information passes through the early stage to develop a new interpretation of the stimuli (Sheppes & Gross, 2011). For example, someone may view the highly disturbing movie scene as uncomfortable and implement neutral interpretations (e.g., "it is only a movie") to regulate his or her emotions. However, since the stimuli entered the late stage where its affective meaning was processed (creating his or her discomfort), a conflict between the emotion and the reappraisal occurs, as this reappraisal strategy attempts to override the already developed emotion. Consequently, this strategy is affected by the emotional content and therefore may not have been entirely effective. The success of reappraisal might then depend on the emotional intensity (Sheppes & Meiran, 2007).

Sheppes and Meiran (2007) found support for the process-specific timing hypothesis. They investigated the differential effects of distraction and reappraisal on negative mood and

memory by showing participants emotional film clips. The emotional intensity of the clips was manipulated by instructing participants to use either distraction or reappraisal either early on during the film clip (37.5 s from the film's onset, i.e., low intensity) or late in the film clip (114.0 s from the film's onset, i.e., high intensity). Findings showed that when distraction and reappraisal were employed early, participants experienced lower levels of negative experience relative to the control group, $F(1, 27) = 8.35$, $p < .01$, and did not differ from one another, $F(1, 27) < 1$. However, when initiated late, distraction was more effective than reappraisal, as levels of negative experience relative to the control group were significantly lower following the use of distraction, $F(1, 27) = 6.98$, $p < .02$, than following the use of reappraisal, $F(1, 27) < 1$. Furthermore, initiating reappraisal late resulted in greater self-reported negative experience relative to early initiation, $F(1, 81) = 3.81$, $p = .054$. Sheppes and Meiran (2007) refer to this as a point of no return, a point during the evolving emotional experience after which some emotion regulation strategies, such as reappraisal, are less effective.

In another experiment, Sheppes and Meiran (2007) administered a surprise memory test to participants after viewing the film clips. When distraction was initiated early (37.5 s from the film's onset), memory for the film content from that point on was worse relative to the control group, $F(1, 81) = 6.28$, $p < .02$. Similarly, when distraction was initiated late (114.0 s from the film's onset), memory for the remaining part of the film was worse relative to the control but was nonsignificant. Conversely, memory scores following the use of reappraisal did not significantly differ from control group scores (Sheppes & Meiran, 2007).

Taken together, these findings reveal that, when initiated during low-intensity emotional situations, both distraction and reappraisal were successful in regulating negative experience.

However, when initiated during high-intensity emotional situations, reappraisal was less successful at regulating negative mood and even counterproductive compared to distraction, which remained an effective strategy. Furthermore, the results from the memory tests were consistent with the prediction that distraction and reappraisal facilitate emotion regulation at different stages of information processing (Sheppes & Meiran, 2007).

These studies demonstrate that different regulatory strategies are better suited for different situations and support the proposition that the flexible use of strategies across varying emotional contexts promotes healthy adaptation. However, one major limitation of these studies is that they do not appear to directly measure emotion regulation flexibility since participants were instructed on which strategies to use. Additionally, this approach provides limited insight into how people act when naturally regulating their emotions.

Emotion Regulation Choice Task

To address this gap, Sheppes et al. (2011) developed the emotion regulation choice task, an innovative performance-based paradigm to examine how participants regulated their emotions under conditions of low and high levels of intensity. In three separate studies, Sheppes and colleagues (2011) manipulated negative emotional contexts by presenting a sample of healthy participants with either emotionally evocative images of low- and high-intensity (experiments 1 and 2) or unpredictable electric stimulation (experiment 3). Prior to presentation of stimuli, participants were trained on how to use two emotion regulation strategies (i.e., distraction and reappraisal). Consistent with Sheppes and Meiran's (2007) research, Sheppes and colleagues

(2011) expected participants to demonstrate flexibility in their regulatory choices, preferring reappraisal for situations of low-intensity and distraction for situations of high-intensity.

The paradigm for both studies consisted of three phases: a four-trial training phase, an eight-trial practice phase, and a 30-trial choice phase (Sheppes et al., 2011). In the training phase, participants were instructed on which strategy to employ in each trial while viewing four pictures. For distraction, participants were to think of something emotionally neutral (e.g., walking on campus). For reappraisal, participants were to think of the images in a way that reduced their negative meaning (e.g., help is on the way). There were two training trials for both strategies, with each trial using one low-intensity and one high-intensity image. The order of these trainings was counterbalanced (Sheppes et al., 2011).

The first four trials of the subsequent practice phase were identical to the training phase (Sheppes et al., 2011). In the remaining four trials thereafter (two at each intensity level), participants freely chose which strategy to employ. To ensure participants learned and properly employed each strategy, they were instructed to talk about each strategy they were using during the training and practice phase out loud and were corrected as needed. Participants were asked to do the same during the choice phase of the second experiment. Finally, participants completed the 30-trial choice phase. For each trial, participants viewed a picture for 500 ms. After the viewing they chose between distraction and reappraisal by pressing one of two response buttons (the buttons assigned for each strategy were counterbalanced across participants; Sheppes et al., 2011).

Results from both experiments supported their hypotheses. The first experiment revealed that 90% of participants (N = 20) showed a relative preference for reappraisal on low-intensity

trials (76.3%) and a relative preference for distraction on high-intensity trials (70.7%), $F(1, 19) = 47.54$, $p < .001$, $\eta_p^2 = .71$ (Sheppes et al., 2011). The second experiment replicated their initial findings, as 90% of participants ($N = 20$) similarly employed reappraisal across the majority of low-intensity trials (74.9%) and distraction across the majority of high-intensity trials (60.0%), $F(1, 19) = 56.30$, $p < .001$, $\eta_p^2 = .75$. These findings suggest that healthy individuals demonstrate an ability to flexibly switch between different emotion regulation strategies across situations of varying emotional intensity (Sheppes et al., 2011).

In the second experiment, participants were also asked to complete a surprise memory test following the choice phase to assess their memory of the pictures they viewed (Kron, Schul, Cohen, & Hassin, 2010). The memory test was implemented to investigate differential emotional processing of the two strategies. Specifically, Sheppes et al. (2011) expected that, because distraction is a disengagement strategy that involves blocking emotional information, the use of this strategy should lead to worse memory as compared to reappraisal, an engagement strategy which involves elaborated emotional processing (Sheppes & Meiran, 2007, 2008). As predicted, the use of disengagement distraction resulted in poorer memory for emotional content ($M =$ 55.3% correct, $SD = 3.4\%$) relative to the use of engagement reappraisal ($M = 65.4\%$ correct, $SD = 2.9\%$), $F(1, 19) = 4.53$, $p < .05$, $\eta_p^2 = .19$ (Sheppes et al., 2011). Additionally, memory test performance was significantly greater than chance (50%) for pictures that participants viewed during the use of reappraisal, $t(19) = 5.12$, $p <. 00001$, but not for pictures that were viewed during the use of distraction, $t(19) = 1.55$, n.s. (Sheppes et al., 2011).

The third experiment sought to conceptually replicate the previous two studies, testing participants' ($N = 16$) emotional regulation choice patterns in a similar paradigm that used

electric shocks in lieu of emotional pictures to investigate the effects of an emotion-eliciting context (Sheppes et al., 2011). Low- and high-intensity shocks were determined using custom calibration and were administered via two electrodes applied to the lower left arm. For the choice trials, participants regulated anticipatory anxiety by implementing their chosen strategy before the shock. During this anticipatory period, they were presented with a description of the upcoming shock's level of intensity. The length of the anticipatory period varied pseudorandomly across the choice trials. Consistent with the previous two studies, 75% of participants employed reappraisal for the majority of low-intensity-shock trials (66.9%) and distraction for the majority of high-intensity-shock trials (64.3%), $F(1, 15) = 11.29$, $p < .01$, $\eta_p^2 = .43$ (Sheppes et al., 2011).

It is important to note that while the emotion regulation choice task suggests that emotional intensity is a strong determinant in emotion regulation choice, it does not afford the investigation of other factors that might influence the use of regulatory strategies, including individuals' goals and cognitive resources (Sheppes et al., 2011). Nonetheless, these data show that healthy individuals demonstrate emotion regulatory flexibility. More specifically, reappraisal was preferred under situations of low emotional intensity. When faced with situations of high emotional intensity, participants favored disengaging from the stimuli via distraction, in turn blocking emotional processing. Importantly, studies suggest that certain clinical populations are often deficient in this flexibility.

As stated, many forms of psychopathology are shown to have some degree of emotion dysregulation (e.g., depression, anxiety, PTSD, BPD) and inflexible responding to situations of varying intensity (Cisler et al., 2010; Cloitre et al., 2005; Ehring et al., 2010; Lynch et al., 2007).

Consequently, understanding what factors constitute and promote adaptive emotion regulatory flexibility remains of clinical relevance. To this end, examination of mindfulness warrants consideration as it has demonstrated links with improvements in cognitive flexibility and emotion regulation (Baer et al., 2006; Feldman, Hayes, Kumar, Greeson, & Laurenceau, 2007; Moore & Malinowski, 2009).

Mindfulness

Mindfulness is conceptualized as attending to each moment, feeling, thought, and sensation as it occurs in the present moment in a nonjudgmental manner (Garland, 2007; Kabat-Zinn, 1994; Lutz, Slagter, Dunne, & Davidson, 2008), though researchers differentiate between state and trait mindfulness. The state of mindfulness can be cultivated through practice, which entails focusing attention toward a select aspect of an experience while allowing any thoughts and emotions to arise and dissipate on their own (Garland, Gaylord, & Fredrickson, 2011). With repeated practice, this process of acknowledging and letting go of internal experiences without judgment is thought to foster trait or dispositional mindfulness, which reflects a tendency to engage in this form of metacognitive awareness throughout daily life (Chambers et al., 2009; Garland et al., 2010; Garland et al., 2011). It is worth noting that trait mindfulness has also been observed in nonmeditating samples (Baer et al., 2008). With roots in eastern traditions (Sujato, 2005), mindfulness has more recently been embraced by western society and is being studied extensively for its applications in psychology and neuroscience for its health-promoting qualities.

Mindfulness has exhibited relationships with greater well-being (Brown & Ryan, 2003) and has demonstrated utility when targeted in various mindfulness-based interventions (MBI;

Baer, 2003), such as mindfulness-based stress reduction (MBSR; Kabat-Zinn, 1994) and acceptance and commitment therapy (ACT; Hayes, Strosahl, & Wilson, 1999). For instance, MBIs have been shown to improve symptoms across various clinical populations, including patients with psychosis (Bach & Hayes, 2002; Gaudiano & Herbert, 2006), major depressive disorder (MDD; Ma & Teasdale, 2004; Piet & Hougaard, 2011; Teasdale et al., 2000), and panic and generalized anxiety disorder (GAD; Evans et al., 2008; Kabat-Zinn et al., 1992; Miller, Fletcher & Kabat-Zinn, 1995). The cumulative evidence of the benefits of mindfulness warrants understanding of its underlying mechanisms.

Mindfulness and Emotion Regulation

One of the potential ways in which mindfulness aids in reducing distress may lie within its relationship with emotion regulation (Baer et al., 2006; Feldman et al., 2007). For instance, Chambers, Lo, and Allen (2008) found that increased levels of self-reported mindfulness were associated with decreased levels of self-reported rumination, depressive symptoms and anxiety. Given the presence of rumination in these disorders (Nolen-Hoeksema, 2000), these findings suggest that the effect of mindfulness on rumination may have led to symptom improvement.

The link between mindfulness and emotion regulation is well supported in the neuroscience literature (Brown, Goodman, & Inzlicht, 2012; Creswell, Way, Eisenberger, & Lieberman, 2007; Desbordes et al., 2012; Modinos, Ormel, & Aleman, 2010; Zeidan, Martucci, Kraft, McHaffie, & Coghill, 2013). Areas of the brain involved in regulating emotions include the prefrontal cortex (PFC) and the amygdala. Previous research suggests that down-regulating negative affective responses stimulates increased activation in regions of the PFC, producing an

inhibitory effect on the amygdala (Beauregard, Levesque, & Bourgouin, 2001; Harenski & Hamann, 2006; Ochsner, Bunge, Gross, & Gabrieli, 2002; Ochsner et al., 2004; Ohira et al., 2006). Utilizing neuroimaging, Creswell and colleagues (2007) found trait levels of mindfulness to be associated with these same brain regions. Specifically, trait mindfulness was associated with activation of more areas of the PFC, including the ventrolateral PFC, the medial PFC, and the dorsolateral PFC, as well as reduced amygdala responses. In addition, strong inverse relationships between activity in these areas were observed only in participants high in mindfulness, suggesting that trait mindfulness might be associated with enhancements in these neural pathways shown to be instrumental in affect regulation (Creswell et al., 2007; Kalisch et al., 2005; Ochsner et al., 2002; Urry et al., 2006). There are several ways in which mindfulness is thought to generate this effect, including decentering, enhanced attention, reduced emotional reactivity, better affect labeling, and greater cognitive flexibility.

Decentering

Decentering, or reperceiving, refers to a shift in how one relates to their moment-by-moment experience (Safran & Segal, 1990). Specifically, it entails moving away from viewing one's internal and external experience (e.g., thoughts, emotions, sensations) as a reflection of one's identity. Consequently, these experiences are allowed to be viewed more objectively and without judgment (Shapiro et al., 2006). Thus, rather than identifying with and feeling defined by the contents of one's experience, thoughts and feelings are dispassionately observed as objects of awareness merely being acknowledged instead of evaluated (Hayes et al., 1999; Shapiro et al., 2006). This nonjudgmental relationship toward subjective experience is fundamental across

many operational definitions of mindfulness and is necessary for an attitude of curiosity, openness, and acceptance (Bishop et al., 2004; Hayes et al., 1999; Kabat-Zinn, 1994).

Decentering seems to play an important role in self-referential processing. Self-referential processing, or self-reflection, includes judgments about one's feelings and has been associated with rumination and negative, depression-inducing cognitions about the self (Beck, Rush, Shaw, & Emery, 1979; Farb et al., 2007; Watkins & Teasdale, 2001; Way, Creswell, Eisenberger, & Lieberman, 2010). Mindfulness training and trait mindfulness have both been associated with decreased activation in neural areas that underpin self-referential processing (Farb et al., 2007; Way et al., 2010).

During a resting state, Way and colleagues (2010) found lower levels of resting activation in medial prefrontal and parietal self-referential areas among participants high in trait mindfulness. Conversely, individuals high in depressive symptoms exhibited higher levels of resting activation in medial prefrontal areas, indicating greater self-relevant processing. These results may indicate that individuals high in trait mindfulness tend not to engage in self-focused processing at rest and may not be as attached to thoughts and feelings about the self (Way et al., 2010). The process of decentering appears to result from the enhanced attentional capacity associated with mindfulness (Bishop et al., 2004; Chambers et al., 2008; Farb et al., 2007; Froeliger et al., 2012; Jha, Krompinger, & Baime, 2007; Shapiro et al., 2006; Siegel, 2007).

Improved Attention

Neuroimaging studies have identified several brain areas affected by mindfulness training that are associated with attentional processes, such as mind wandering, as well as emotional and

self-referential processes. These regions include the default mode network (DMN), the dorsal attentional network (DAN), and the central executive network (CEN; Froeliger et al., 2012; King et al., 2016). For instance, in a sample of combat veterans with PTSD, King et al. (2016) found increases in connectivity between the DMN and regions within the CEN following a 16-week therapy involving daily mindfulness training. These results reflect a potential mechanism for decentering, as they indicate an enhanced capacity among meditators to govern one's attention, redirecting it away from narrative, self-referential states, to a more present-centered focus involving interoception and attending to sensations (King et al., 2016). Further, connectivity in these networks has been shown to increase with meditation experience (Froeliger et al., 2012). King and colleagues (2016) suggest that greater connectivity between these regions may contribute to the emotion regulation benefits conferred by mindfulness training, as it consists of exercising control over mental and emotional states.

Such evidence for greater attentional control is also observed among meditation-naïve participants. In their neuroimaging study, Modinos et al. (2010) investigated whether trait mindfulness would modulate brain activity in the PFC and anterior cingulate cortex (ACC) elicited during an instructed reappraisal task. Participants (N = 18) viewed neutral (22) and negative (44) pictures and were instructed to either attend to or reappraise the content of the picture. As predicted, individual differences in mindfulness modulated brain activity in regions involved in cognitive control and attention. More specifically, mindfulness traits were positively associated with dorsomedial prefrontal cortex (DMPFC) activity during reappraisal, an area also involved in attention and working memory (Modinos et al., 2010; Smith & Jonides, 1999). Consistent with the emotion regulation literature (Beauregard et al., 2001), this neural activation

within the DMPFC was inversely related to the amygdala's response to negative content, indicating its down-regulating influence on emotion-generating regions (Modinos et al., 2010).

These results suggest that more mindful individuals might have greater success at employing top-down appraisals that lead to the down-regulation of amygdala activity (Modinos et al., 2010). Given the amygdala's ability to bias and orient attention toward emotionally relevant stimuli (Herry et al., 2007), this finding is consistent with the notion that mindfulness is associated with a less restrictive attentional capacity. Moreover, this dampened amygdala activity may account for the reduced reactivity associated with mindfulness.

Reduced Emotional Reactivity

Emotional reactivity is how one reacts to aversive experiences, such as life stressors and negative emotions (Greeson, Garland, & Black, 2014). Habitually reacting to such experiences intensely and automatically has been linked to various forms of psychopathology (Greeson et al., 2014; Kring & Sloan, 2010; O'Neill, Cohen, Tolpin, & Gunthert, 2004; Parrish, Cohen, & Laurenceau, 2011; Schneiders et al., 2006). Thus, efforts to mitigate emotional reactions to interpersonal, physical, and emotional stressors remain relevant to emotion regulation research (Greeson et al., 2014).

Numerous studies have evidenced an association between mindfulness and diminished psychological and physiological reactivity to a variety of stressors. This effect has been observed among both individuals with higher levels of trait mindfulness and individuals following mindfulness trainings (Arch & Craske, 2006, 2010; Brown, Weinstein, & Creswell, 2012; Creswell et al., 2014; Feldman, Lavelle, Gildawie, & Greeson, 2016). Further, correlations

between mindfulness scores and neural activity within limbic regions of the brain (e.g., the amygdala) indicate reduced reactivity at the psychophysiological level (Creswell et al., 2007; Desbordes et al., 2012; Van den Hurk et al., 2010; Way et al., 2010).

Feldman and colleagues (2016) investigated the role of trait mindfulness in the relationship between subjective distress and physiological reactivity. Participants (N = 100) completed self-report measures of trait mindfulness and then were fitted with electrodes to measure skin conductance and heart rate while they completed a stressful laboratory task. Any errors during the task produced a loud buzzer sound and resulted in restarting. Afterward, participants rated their negative affect. Consistent with their hypotheses, mindfulness was found to moderate the association between subjective distress and physiological arousal. Specifically, among more mindful participants, elevated heart rate was not accompanied by elevated distress. Conversely, less mindful participants reported greater distress after experiencing elevated heart rate (Feldman et al., 2016).

Additional analyses of individual mindfulness facets revealed the nonjudging subscale of the mindfulness measure to moderate the association between heart rate and negative affect. These findings suggest that more mindful individuals, who are less judgmental of thoughts and feelings (i.e., engaging in decentering), may have been less emotionally reactive to changes in their heart rate (Feldman et al., 2016). This observed effect indicates that responding to inner experience judgmentally may exacerbate the subjective distress. Individuals with the ability to decenter, however, may be more accepting of their inner experience (e.g., physiological arousal), consequently feeling less upset by it (Feldman et al., 2016). Emotional reactivity appears to also be linked to another benefit of mindfulness known as affect labeling.

Affect Labeling

Affect labeling, or emotion differentiation, is the ability to accurately label and discriminate between different emotional states, a process with implications for effective emotion regulation (Barrett, Gross, Christensen, & Benvenuto, 2001; Gratz & Roemer, 2004). For instance, Barrett et al. (2001) found that individuals with a propensity to label and differentiate between negative emotional states reported more frequent regulation using a range of strategies. Consistent with these findings, mindfulness measures containing subscales that assess this ability have been correlated with greater emotional intelligence and life satisfaction (Baer, Smith, & Allen, 2004; Baer et al., 2006).

Using PalmPilots, Hill and Updegraff (2012) instructed participants to complete six random daily assessments on their emotions for one week to study the relationship between trait mindfulness, emotion lability (indicative of reactivity), emotion differentiation, and emotion dysregulation. Overall, higher levels of mindfulness related to less emotional lability, greater emotion differentiation (of both negative and positive emotions), and less emotion dysregulation. Moreover, follow-up regression analyses revealed that the nonreactivity subscale of the mindfulness measure most strongly predicted greater emotion differentiation. These results indicate that the tendency to be less reactive toward one's experiences facilitates better discrimination between emotional states (Hill & Updegraff, 2012). These findings are reinforced in the neuroscience literature, as trait mindfulness has demonstrated associations with reduced amygdala activity during an affect labeling task (Creswell et al., 2007; Lieberman et al., 2007). All of these components – decentering, increased attentional capacity, reduced reactivity, and

better affect labeling – are thought to coalesce and contribute to greater cognitive flexibility (Shapiro et al., 2006).

Cognitive Flexibility

Conceptually related to emotion regulatory flexibility, cognitive flexibility reflects a disengagement from rigid, habitual reactions and behaviors, allowing for a greater range of responses to challenges (Bishop et al., 2004; Hayes & Wilson, 2003; Hayes & Shenk, 2004; Roemer & Orsillo, 2003; Shapiro et al., 2006). Many researchers consider cognitive flexibility to result largely from decentering (Frewen, Evans, Maraj, Dozois, & Partridge, 2008; Shapiro et al., 2006). Indeed, Teper and Inzlicht (2013) found that greater acceptance of emotions mediated the relationship between meditation and improved Stroop performance, highlighting the role of decentering. However, other studies have also established links between various measures of cognitive flexibility and other facets of mindfulness, including observing, describing, acting with awareness, nonjudging of inner experience, and nonreactivity to inner experience (Anicha et al., 2012; Moore & Malinowski, 2009).

Baer and colleagues (2008) provide descriptions for each facet. Observing refers to attending to one's experiences, both internal and external. These experiences include physical sensations, sights, sounds, smells, thoughts, and emotions. Describing is consistent with affect labeling and emotional discrimination, measuring one's tendency to label internal experiences with words. Acting with awareness can be described in contrast to what is often called automatic pilot or behaving mechanically and devoid of attention. Thus, this facet measures the extent to which one attends to activities of the moment and may be related to the evidenced attentional

improvements associated with mindfulness. In line with decentering, nonjudging includes adopting a nonevaluative orientation to one's thoughts and feelings. Last, the nonreactivity subscale is compatible with reduced emotion reactivity, as it measures one's propensity to let go of fleeting thoughts and feelings rather than ruminate on them.

Taken together, these findings suggest that the demonstrable benefits associated with mindfulness, which include decentering, improved attentional capacity, reduced emotional reactivity, and better affect labeling, rarely occur independently of each other, but rather appear to be interrelated, and thus may synergistically promote cognitive flexibility. This more adaptive and expanded range of responses is theoretically consistent with the construct of emotion regulatory flexibility and therefore may account for the observed improvements in emotion regulation afforded by mindfulness. However, although mindfulness and emotion regulation have been linked, to date, relations between mindfulness and regulatory flexibility have yet to be considered. The lack of research on mindfulness within this context may be attributable to its many and often conflicting operational distinctions (Bishop et al., 2004; Brown & Ryan, 2004). In light of the evidence presented, this study adoptrf the perspective that mindfulness is comprised of five facets: observing, describing, acting with awareness, nonjudging of inner experience, and nonreactivity to inner experience (Baer et al., 2006, 2008). Measuring these dimensions of mindfulness independently allows for an investigation of their differential relationships with emotion regulatory flexibility (Baer et al., 2008).

This Study

Sheppes et al. (2011) found that healthy individuals exhibit flexibility in their emotion regulation strategies, preferring reappraisal for low-intensity emotional situations and distraction

for high-intensity emotional situations. Other studies with more symptomatic samples have also demonstrated that poorer flexibility predicts greater symptoms of psychopathology (Levy-Gigi et al., 2016). These data are consistent with the coping and emotion regulation literature, which indicate that different situations demand different regulatory strategies, and that adjustment is facilitated when a strategy is compatible with the situation (Barrett & Gross, 2001; Bonanno, 2001; Bonanno et al., 2004; Cheng, 2001; Miller, 1992). Taken together, these results suggest that adaptive regulatory flexibility consists of employing distraction in situations of high emotional intensity and reappraisal in situations of low emotional intensity.

While research on mindfulness reveals positive improvements in emotion regulation, many studies have relied heavily on self-report measures of emotion regulation strategies to demonstrate the relationship between these two constructs (Coffey & Hartman, 2008; Hill & Updegraff, 2012; Kumar, Feldman, & Hayes, 2008; Mandal, Arya, & Pandey, 2014; Roemer et al., 2009). To the author's knowledge, no study at present has directly investigated emotion regulatory flexibility among individuals with varying levels of trait mindfulness. this study sought to replicate and extend the findings of Sheppes et al. (2011) by utilizing the same emotion regulation choice task to examine the relationship between the five facets of trait mindfulness and emotion regulatory flexibility. Since mindfulness has been shown to promote cognitive flexibility (Moore & Malinowski, 2009; Wenk-Sormaz, 2005; Teper & Inzlicht, 2013), each constituent facet was expected to predict varying levels of emotion regulatory flexibility except for the observe facet. Since the observe facet represents a more advanced skill developed with formal mindfulness training (Baer et al., 2008), it was not expected to predict regulatory flexibility in this study's student sample.

The emotion regulation choice task has been shown to be a reliable and valid behavioral measure. To ensure regulatory choice adherence, previous studies coded descriptions of selected strategies for reappraisal and distraction by judges who were blind to participants' choices (participants either verbalized or wrote about their strategies). Levels of agreement ranged from 98.4% to 99.6%, indicating that participants implement and adhere to their indicated choice of strategy (Levy-Gigi et al., 2016; Sheppes et al., 2011). To assess internal response consistency for each emotional intensity level, Levy-Gigi et al. (2016) applied the Kuder-Richardson 20 index (KR-20). Findings revealed good internal consistency of the task, with reliability of KR-20 = .81 (95% CI = .75, .87) for low emotional intensity and KR-20 = .78 (95% CI = .73, .83) for high emotional intensity. They also tested the reliability of the flexibility measure (i.e., subtracting distraction under low-intensity from distraction under high-intensity). Their analysis revealed an intra-class correlation of .80 (95% CI = .74, .87), indicating good internal consistency of their flexibility index (Levy-Gigi et al., 2016).

Hypotheses

Hypothesis 1

Consistent with the main findings by Sheppes et al. (2011), participants were expected to demonstrate a relative preference for reappraisal on low-intensity trials and distraction on high-intensity trials. The following specific predictions were derived from this hypothesis:

H1a: The proportion of trials on which reappraisal is chosen will be significantly greater following presentation of the low-intensity negative pictures compared to the high-intensity negative pictures.

H1b: The proportion of trials on which distraction is chosen will be significantly greater following presentation of the high-intensity negative pictures compared to the low-intensity negative pictures.

Hypothesis 2

Sheppes et al. (2011) found that participants demonstrated poorer recall (i.e., high proportion of errors) for high-intensity negative pictures than low-intensity negative pictures. Thus, the following predictions were made:

H2a: The proportion of errors on the surprise memory test will be significantly higher for high-intensity negative pictures than low-intensity negative pictures.

H2b: Given the predictions in Hypothesis 1, participant's use of distraction following high-intensity negative pictures will significantly predict their recall for these pictures (i.e., proportion of errors) on the surprise memory test.

Hypothesis 3

After removing shared variance between each facet, higher scores on the following four facets of mindfulness will significantly predict greater regulatory choice flexibility – describing, acting with awareness, nonjudging, and nonreactivity. After removing shared variance between each facet, higher scores on the observing facet of mindfulness will not significantly predict greater regulatory choice flexibility relative to the other four facets.

CHAPTER 2

METHODOLOGY

Participants

Participants consisted of 87 undergraduate students enrolled in introductory psychology classes at a large Midwestern university. One participant discontinued after the survey and did not complete the lab task and was thus excluded from analyses; eight participants were excluded due to responding incorrectly to forced response items (e.g., "Please select rarely"). The final sample was comprised of 78 participants (62.8% female; M_{age} = 19.82, *SD* = 2.03, range = 18-34). Regarding race, 73.1% reported identifying as White, 15.4% as Black or African American, 2.6% as Asian or South-Asian, 5.1% as other, and 3.8% preferred not to respond; 19.2% of participants reported identifying as Latino, Hispanic, or being of Spanish origin. For subsequent analyses, race and ethnicity were combined into a single dummy variable (White/Non-Hispanic = 1 [60.3%] vs. Other = 0 [35.9%]). Participants received research credits for their participation.

Power Analysis

G*Power 3.1 software (Faul, Erdfelder, Buchner, & Lang, 2009) was utilized to determine the appropriate sample size for the current study. An effect size of f^2 = .11 was chosen to power the study to detect effects that account for at least 10% variance in the outcome with at least 80% power. This study tested four predictors for significance. Each predictor was tested with an adjusted alpha level of .0125 to maintain a family-wise error rate of 5% (i.e., .05/4 =

.0125). The power analysis determined that a sample of 105 would achieve these criteria. Thus, the current study may not have enough power, and findings should be interpreted cautiously.

Self-Report Measures

A nine-item demographics questionnaire was administered for descriptive purposes to assess gender, age, race/ethnicity, education, marital/relationship status, and income (Appendix A).

Five-Facet Mindfulness Questionnaire (Appendix B). The Five-Facet Mindfulness Questionnaire (FFMQ; Baer et al., 2006) is a 39-item questionnaire that assesses five factors of trait mindfulness (Appendix B). Participants respond to each item on a 5-point Likert-type scale (1 = *never or very rarely true*, 2 = *rarely true*, 3 = *sometimes true*, 4 = *often true*, 5 = *very often or always true*), with higher summed scores representing higher levels of trait mindfulness. Baer et al. (2008) found relationships with psychological symptoms and other constructs to vary by facet, and thus suggest the use of individual subscales rather than a total FFMQ score. However, several studies have previously utilized the total FFMQ score as an indicator of overall mindfulness (for a review, see Park et al., 2013). Twenty-one items measure the presence of mindfulness, whereas the remaining 18 items measure the absence of mindfulness and are therefore reverse-scored. Example items include, “I’m good at finding words to describe my feelings” (mindfulness-present), and “When I do things, my mind wanders off and I’m easily distracted” (mindfulness-absent).

The FFMQ was developed after participants (N = 613) completed five separate mindfulness questionnaires. Baer et al. (2006) combined the responses into a single data set and

ran exploratory factor analyses (EFA) which revealed 26 factors. However, the scree plot suggested a five-factor solution, prompting a second EFA that specified five factors and resulted in a five-factor solution which accounted for 33% of the variance (Baer et al., 2006). These factors are separate but related, with correlations ranging from .32 to .56 (*p*s < .01), and include observing (8 items), describing (8 items), acting with awareness (8 items), nonjudging of inner experience (8-items), and nonreactivity to inner experience (7 items; Baer et al., 2008).

The FFMQ's five-factor hierarchical structure has been confirmed in samples of meditators (*N* = 180) (Baer et al., 2008). However, the Observe subscale does not appear in nonmeditators (*N* = 268), and thus may represent a more advanced skill of mindfulness that requires training (Baer et al., 2006). Van Dam, Earleywine, and Danoff-Burg (2009) found that meditators and nonmeditators responded differently to certain items on the FFMQ. More specifically, a significant difference emerged between responses to items that measure presence of mindfulness and items that measure absence of mindfulness among nonmeditators only. Consequently, the FFMQ might be problematic when comparing meditators to nonmeditators, or when assessing mindfulness as a pre-post measure following practice (Van Dam et al., 2009). This should not pose a problem for this study since there is neither a between-groups comparison of meditators and nonmeditators nor a pre-post assessment of trait mindfulness. Moreover, given the dearth of research on mindfulness and emotion regulation flexibility, it remains to be seen how the Observing facet relates to this construct, if at all. Thus, this subscale was included in the analyses.

The FFMQ has evidenced strong psychometric properties, including good construct validity for the global FFMQ and its subscales as well as adequate internal consistency with

Cronbach alphas ranging from .67 to .93 (Baer et al., 2006; Barnes & Lynn, 2010; Cash & Whittingham, 2010; Fisak & von Lehe, 2012; Hollis-Walker & Colosimo, 2011; Lavender, Gratz, & Tull, 2011; Park, Reilly-Spong, Gross, 2013).

In this study, internal consistency for the FFMQ was as follows: $\alpha = .89$ (FFMQ total), $\alpha = .77$ (Observing), $\alpha = .88$ (Describing), $\alpha = .89$ (Awareness), $\alpha = .88$ (Nonjudging), $\alpha = .75$ (Nonreactivity).

Procedures

Each participant completed the task individually. At the start of the session, participants reviewed the informed consent. Participants who consented to the current study completed a survey followed by the emotion regulation choice task. The procedures replicated those used by Sheppes et al. (2011; experiment 2) and consisted of a training phase, a practice phase, and a choice phase.

During the initial four-trial training phase, participants were instructed on which strategy to employ in each trial. Prior to presentation of the pictures, participants were trained to use the two emotion regulation strategies (distraction and reappraisal). This phase consisted of two trials for each strategy (one low-intensity and high-intensity image for each trial), with the order of each strategy being counterbalanced. The distraction instructions (as utilized by Sheppes et al., 2014) were as follows:

> Try your best to feel less negative about the picture by thinking of something that is completely unrelated to the picture. There are a few ways you can do this. First, you could imagine your neighborhood or other familiar streets. For instance, if you see a negative picture of a woman who has been burnt, you could think of biking around campus and the different buildings around you. Second, you could imagine yourself doing everyday tasks, such as taking a shower or making coffee in the morning. You

> could use any one of these ways to distract yourself that you think will work best in making you feel less negative, and you don't have to use the same way to distract all the time. However, it is important that you keep your eyes on the picture and not avert your gaze. Also, when distracting, it's important that you not focus on something that is highly emotional, so we don't want you to think about anything that brings you sadness or extreme happiness. (p. 167)

The reappraisal instructions (as utilized by Sheppes et al., 2014) were as follows:

> Try your best to feel less negative about the picture by attending to the picture and trying to change the meaning of it. That means you think of something to tell yourself about the picture that helps you feel less negative about it. So, for example, you could tell yourself something about the outcome, so that whatever is going on will soon be resolved or that help is on the way. You could also focus on a detail of the situation that may not be as bad as it first seemed. But we want you to stay focused on the picture and not think of random things that make you feel better, but rather to change something about the picture that helps you to feel less negative about it. Once again, keep focusing on the picture but tell yourself something about the picture that makes you feel less negative about the picture. (p. 167)

The subsequent practice phase consisted of seven trials (Sheppes et al., 2011). The first five trials were identical to the training phase, insofar as participants were instructed on which strategies to use. In the subsequent two trials (one at each intensity level), participants freely chose which strategy to employ. Finally, participants completed the 30-trial choice phase. For each trial of the choice phase, a picture was previewed for 500 ms, and participants chose between distraction or reappraisal by pressing one of two response keys on a computer keyboard: either the "a" or the "l" key. The keys assigned for each strategy were counterbalanced across participants. Participants then implemented their selected strategy while viewing the picture for 5,000 ms. To ensure participants learned each strategy and were properly employing them, they were instructed to talk out loud about each strategy they were using during each phase and were corrected as needed (Sheppes et al., 2011). The main finding of this paradigm by Sheppes et al.

(2011) is that healthy participants respond adaptively, displaying a relative preference for reappraisal during the low-intensity images and distraction during the high-intensity images.

Following the choice phase, participants completed a surprise memory test to assess their memory for the images they had seen during the choice phase (Kron et al., 2010; Sheppes et al., 2011). Participants were presented with two pictures in each of the 30 trials of the memory test: a picture the participant had already seen during the choice phase (e.g., a picture of a crying baby) and a Photoshop-modified version of the same picture. A central emotional feature was altered in each of the modified pictures, with half of them having added features (e.g., the baby had extra tears) or removed features (e.g., the baby was missing a few tears). A keyword reflecting the difference between the pictures (e.g., tears) was presented above the two pictures in each trial (Sheppes et al., 2011).

Stimuli

Participants viewed pictures taken from the International Affective Picture System (Lang, Bradley, & Cuthbert, 2008). The emotional intensity of the pictures ranged from images of a crying baby to a mutilated hand. The pictures were divided into two sets of varying levels of emotional intensity based on their normative ratings for arousal (1 = *low*; 9 = *high*) and valence (1 = *very unpleasant*; 9 = *highly pleasant*). In their study, Sheppes et al. (2011) divided pictures into two sets of 15 low-intensity pictures (mean arousal = 5.01; mean valence = 3.41) and 15 high-intensity pictures (mean arousal = 6.12; mean valence = 1.99, Fs (1, 28) > 19.01, ps < .001) to be presented during the choice phase. Previous studies utilizing measures of physiological arousal and electrocortical markers of negativity have supported the arousal and valence

differences in magnitude separating Sheppes and colleagues' (2011) low- and high-intensity stimuli as sufficient to trigger different levels of emotional-response activation (Bradley, Codispoti, Cuthbert, & Lang, 2001; Weinberg & Hajcak, 2010).

CHAPTER 3

RESULTS

Data Analysis Plan

Within-group differences in emotion regulation choice were analyzed using repeated-measures analysis of variance (ANOVA). Hypothesis 2 was also analyzed using ANOVA to assess mean differences in memory test performance between low- and high-intensity images. Last, a hierarchical multiple regression was implemented to test the individual relationship between facets of trait mindfulness and emotion regulatory flexibility. In line with Levy-Gigi et al. (2016), the dependent variable of regulatory flexibility was determined by subtracting the proportion of distraction choice on low-intensity images from the proportion of distraction choice on high-intensity images. Data was centered, with higher scores representing greater regulatory flexibility. Statistical analyses were conducted in the Statistical Package for the Social Sciences (SPSS) Version 22.

Preliminary Analyses

All self-report data were first screened for quality. Descriptive statistics, histograms, and box plots were analyzed to identify potential outliers. No influential outliers were identified. Next, the statistical assumptions of linear regression were assessed (i.e., linearity, normality, independence, and homoscedasticity; Cohen et al., 2003; Tabachnick & Fidell, 2013). Bivariate scatterplots of each independent variable with the dependent variable demonstrated that the

linear relationship was correctly specified (Cohen, Cohen, West, & Aiken, 2003). Model residuals evidenced normal distributions after examining histograms of the residuals for skewness and kurtosis (Williams, Grajales, & Kurkiewicz, 2013). A scatterplot of the predicted values with the standardized residual values of the dependent variable showed that the assumption of homoscedasticity was met (Cohen et al., 2003). Finally, data were inspected for the presence and influence of missing data. Three participants chose not to respond to one item each on the FFMQ. No other missing data were found. Bivariate correlations did not reveal any covariates between demographic variables and main study variables (see Table 1).

Chi-square analyses were used to examine potential demographic differences between the total use of distraction during the laboratory task, proportion of errors on the surprise memory test, and total scores on the five mindfulness facets across categorical demographic variables (i.e., race, gender). Results indicated no significant differences among any of these variables as a function of race: use of distraction (χ^2[15, N = 75] = 15.32, p = .429, Cramér's V = .45); memory test errors (χ^2[10, N = 75] = 17.03, p = .074, Cramér's V = .48); observing (χ^2[22, N = 75] = 17.72, p = .722, Cramér's V = .49); describing (χ^2[24, N = 75] = 21.93, p = .584, Cramér's V = .54); acting with awareness (χ^2[24, N = 75] = 34.39, p = .078, Cramér's V = .67); nonjudging (χ^2[23, N = 75] = 22.00, p = .520, Cramér's V = .54); and nonreactivity (χ^2[18, N = 75] = 15.58, p = .622, Cramér's V = .46). Similarly, there were no significant differences among these variables as a function of gender: use of distraction (χ^2[16, N = 78] = 15.47, p = .491, Cramér's V = .45); memory test errors (χ^2[10, N = 78] = 6.57, p = .766, Cramér's V = .29); observing (χ^2[23, N = 78] = 23.28, p = .445, Cramér's V = .55); describing (χ^2[24, N = 78] = 28.48, p = .240, Cramér's V = .60); acting with awareness (χ^2[24, N = 78] = 30.15, p = .180, Cramér's V = .62); nonjudging

Table 1

Descriptive Statistics and Bivariate Correlations Among Potential Covariates

Scale	1	2	3	4	5	6	7	8	9	10
Age	--									
Race (% White)	.124	--								
Gender (% Male)	.253*	.099	--							
Regulatory Flexibility	-.020	-.045	-.148	--						
Trait Mindfulness	.223*	.056	.099	-.339**	--					
Observing	.114	-.227*	-.149	-.057	.451**	--				
Describing	.311**	.042	.121	-.200	.812**	.241*	--			
Acting with Awareness	.127	.037	.120	-.263*	.729**	.087	.523**	--		
Non-judging	-.037	.210	.060	-.392**	.651**	-.141	.505**	.438**	--	
Non-reactivity	.244*	.094	.176	-.122	.520**	.416**	.233*	.153	.099	--
Min	18.28	0	0	-.20	82	11	14	8	9	9
Max	34.46	1	1	.87	180	39	40	40	40	33
Mean	19.82	.63	.37	.40	128.49	25.65	27.27	25.87	28.76	20.94
SD	2.03	.49	.49	.21	18.83	5.57	6.20	6.40	6.67	4.39
N	78	75	78	78	78	78	78	78	78	78

Note. Age = age in years; Race was coded as 1 = Non-Hispanic White and 0 = all others; Gender was coded 1 = Male and 0 = Female; Regulatory Flexibility = mean centered difference score with higher scores indicating greater flexibility (proportion of distraction choice on high-intensity trials – proportion of distraction choice on low-intensity trials); Trait Mindfulness = sum of 39 items of the Five Facet Mindfulness Questionnaire (FFMQ; 1 = *never or very rarely true* to 5 = *very often or always true*) *SD* = standard deviation.

* = $p < .05$, ** = $p < .01$.

(χ^2[23, N = 78] = 21.22, p = .568, Cramér's V = .52); and nonreactivity (χ^2[18, N = 78] = 20.18, p = .323, Cramér's V = .51).

Primary Analyses

To examine Hypothesis 1, a repeated-measures ANOVA was conducted to assess if mean differences exist on the use of regulatory strategy between low-intensity trials and high-intensity trials. The dependent variable was average distraction use. This variable was calculated by computing two count scores by totaling the use of distraction during the 15 low- and 15 high-intensity trials of the "choice phase" of the procedure. As predicted, use of distraction was significantly affected by trial intensity, $F(1, 77) = 286.09$, $p < .001$, $\eta_p^2 = .79$. Post hoc tests using the Bonferroni correction revealed that use of distraction was significantly higher following high-intensity images (M = 9.49, SD = 2.50) compared to low-intensity images (M = 3.47, SD = 2.60), such that participants demonstrated a relative preference for reappraisal across low-intensity trials (76.84%) and distraction across high-intensity trials (63.25%).

Next, a repeated-measures ANOVA was conducted to assess if mean differences exist on the proportion of errors on the surprise memory test between low-intensity trials and high-intensity trials (Hypothesis 2). Proportion of errors on the surprise memory test was the dependent variable with intensity level of images (low vs. high) as the within-subjects factor. However, the proportion of errors on the memory test was not significantly affected by trial intensity, though results were trending toward significance, $F(1, 77) = 3.60$, $p = .06$, $\eta_p^2 = .05$, such that participants were more likely to commit a greater number of errors on the surprise

memory test for high-intensity pictures (M = .34, SD = .11) as compared to low-intensity pictures (M = .30, SD = .11).

For Hypothesis 3, a hierarchical multiple regression analysis was performed to test the relationship between the five facets of trait mindfulness (observing, describing, acting with awareness, nonjudging of inner experience, and nonreactivity to inner experience) and regulatory flexibility. The dependent variable of regulatory flexibility was calculated by subtracting the proportion of distraction choice on low-intensity images from the proportion of distraction choice on high-intensity images (Levy-Gigi et al., 2016). Data were mean centered, with higher scores representing greater regulatory flexibility. To partial shared variance among facets, each mindfulness facet was entered into the first step, thus allowing for investigation of individual effects. Of these facets, only nonjudging of inner experience significantly predicted regulatory flexibility (β = -.40, p < .01), although in the unexpected direction. As predicted, the observing facet did not predict regulatory flexibility (β = -.11, p = .38) but, unexpectedly, neither did any of the remaining facets: describing (β = -.11, p = .46), acting with awareness (β = -.13, p = .33), and nonreactivity to inner experience (β = -.04, p = .73). The overall model was significant and accounted for 18% of the variance in regulatory flexibility, $F(5, 72) = 3.17$, p < .05 (see Table 2).

Table 2

Results of Linear Regression Model with Mindfulness Facets Predicting Regulatory Flexibility

Variable	*B*	*SE*	β	*t*	R^2
Step 1					.18
Observing	-.004	.005	-.111	-.882	
Describing	.004	.005	.105	.740	
Acting with Awareness	-.004	.004	-.126	-.979	
Non-judging	-.013	.004	-.401*	-2.981	
Non-reactivity	-.002	.006	-.041	-.344	

Note. *B* = unstandardized coefficient; *SE* = standard errors; β = standardized coefficient.
* = $p < .01$.

CHAPTER 4

DISCUSSION AND CONCLUSIONS

Discussion

Although much research has been devoted to the study of emotion regulation, little is known about the regulatory choices of individuals during stressful situations. The purpose of this study was to replicate and extend findings by Sheppes et al. (2011) using an emotion regulation choice task. More specifically, we examined individuals' choices to implement distraction and reappraisal in response to low- and high-intensity negative images, as well as the subsequent impact of these regulatory strategies on their ability to recall these same images. Additionally, given evidence that mindfulness may improve emotion regulation, we investigated the ability of five mindfulness facets to predict regulatory choice flexibility. Overall, study hypotheses were partially supported.

As predicted, there was a significant difference between participants' use of regulatory strategy across low- and high-intensity images. Namely, participants demonstrated a relative preference for reappraisal across low-intensity images and a relative preference for distraction across high-intensity images. However, no significant differences on memory test performance were observed between low- and high-intensity images. Last, of the five mindfulness facets, only nonjudging of inner experience predicted emotion regulatory flexibility, but in the opposite direction of what was expected (i.e., negative).

Replication of Sheppes et al. (2011)

Findings from the emotion regulation choice task replicate previous research and support the process-specific timing hypothesis (Sheppes & Gross, 2011; Sheppes et al. 2011). Distraction may have been preferred for most high-intensity negative images in the present study because it serves to block incoming emotional stimuli. Conversely, reappraisal requires information processing to occur before it can be reinterpreted. Thus, utilizing reappraisal for high-intensity negative images involves overriding the already processed emotional information; although the images may be successfully reappraised, it is unlikely that the negative emotion would be altered. Although this study did not evaluate how these regulatory choices predict affect, previous research has found distraction to more effectively reduce negative mood following a high-intensity film scene as compared to reappraisal (Sheppes & Meiran, 2007). Taken together, these results suggest that reappraising a high-intensity situation is more difficult and less effective than distracting oneself and indicate that reappraisal is more conducive to down-regulating negative emotion in low-intensity scenarios.

The finding that the proportion of errors on the surprise memory test was not significantly different across low- and high-intensity negative images was contrary to hypotheses and previous research (e.g., Sheppes et al., 2011). Cronbach and Meehl (1955) propose three possible interpretations of null findings: "(1) The test does not measure the construct variable. (2) The theoretical network which generated the hypothesis is incorrect. (3) The experimental design failed to test the hypothesis properly" (p. 295).

The first proposition would suggest that the laboratory task did not accurately measure participants' memory recall for the negative emotional images. It is notable that participants

previewed all stimuli immediately prior to choosing and then implementing their emotion regulation strategies. This preview phase was necessary to provide participants a basis on which to form a decision regarding whether to use reappraisal or distraction to down-regulate their negative affect. Nonetheless, it is possible that, despite their subsequent use of distraction, participants had already processed the content of the images and thus were able to recall these details later. However, given that participants previewed each image for ~500 ms, this seems an unlikely explanation for these null findings.

Cronbach and Meeh's second suggestion for null findings is that the theoretical basis for the hypothesis is incorrect. Indeed, these findings seemingly contradict the theoretical mechanisms underpinning distraction. That is, if distraction blocks incoming stimuli from being processed, it is unclear why participants did not commit significantly more errors when recalling high- as compared to low-intensity negative images given that distraction was preferred for most of the high-intensity trials (63.25%). However, it is also possible that participants failed to utilize distraction for the high-intensity negative images despite choosing this strategy. The construct of regulatory flexibility is thought to comprise three components: sensitivity to context, repertoire of regulatory strategies, and responsiveness to feedback (Bonanno & Burton, 2013). It appears participants correctly appraised the images when determining which regulatory strategy to implement (i.e., sensitivity to context), but perhaps they were limited in their strategy repertoire. In other words, participants may not have known how to correctly implement distraction; therefore, the design may have failed to correctly test the hypothesis (Cronbach & Meehl, 1955).

Participants in this study were instructed to use distraction by thinking of something emotionally neutral and completely unrelated to the picture while keeping their eyes focused on

the picture (Sheppes et al., 2014). In looking at participants' individual responses during the lab task, it appears they may not have always implemented distractions that were completely unrelated to the picture. For instance, in response to an explicit image of a bloody suicide (high-intensity), examples of participants' distractions included, "Thinking of hospital TV shows I watch;" and, "I'm donating blood today." These examples are not entirely independent of the emotional images, suggesting that participants did not always successfully replace incoming information with unrelated content (Sheppes & Gross, 2011; Van Dillen & Koole, 2007). Rather, their ability to produce content-related responses suggests that some participants may have indeed processed information from high-intensity images. Consequently, their ability to recall these same images may not have been impaired because they were initially represented in working memory (e.g., Van Dillen & Koole, 2007). This interpretation may explain previous nonsignificant findings using the same paradigm (e.g., Hannan & Orcutt, 2015) and highlight potential issues regarding the laboratory task's ability to test true disengagement distraction.

Mindfulness Facets as Predictors of Regulatory Flexibility

The finding that nonjudging of inner experience negatively predicted emotion regulatory flexibility suggests that individuals reporting higher levels of this mindfulness facet may indiscriminately employ distraction and reappraisal, regardless of image intensity. Said differently, these participants may have low sensitivity to context (Bonanno & Burton, 2013). Nonjudging of inner experience promotes a nonevaluative stance toward one's thoughts, feelings, and sensations (Baer et al., 2008). Although seemingly beneficial in reducing emotional reactivity and subjective distress (e.g., Feldman et al., 2016), this may not imply that

nonjudgment increases regulatory flexibility. Rather, nonjudging may hinder the ability to adequately appraise a situation's intensity. In turn, individuals exercising nonjudgment over a situation and how it makes them feel may have no basis for determining their regulatory choices. Thus, the unexpected direction of this relationship suggests that the theoretical basis for the initial hypothesis was incorrect (Cronbach & Meehl, 1955).

As predicted, observing of inner experience was not a significant predictor of regulatory flexibility. Confirmatory factor analyses have shown that the observing facet loads onto an overall mindfulness factor among meditators but not nonmeditators (Baer et al., 2006, 2008; Gu et al., 2016; Siegling & Petrides, 2016; Williams, Dalgleish, Karl, & Kuyken, 2014). The differential functioning of this facet between meditators and nonmeditators suggests that this component of mindfulness and its relationship with other facets is cultivated with formal meditation practice (Baer et al., 2008). Among nonmeditators, then, this facet may merely reflect a tendency to notice experience maladaptively (e.g., rumination) rather than with a nonjudgmental style of awareness (Gu et al., 2016). Thus, given that meditation experience was not an inclusion criterion in the present study, observing likely did not function in a manner theoretically consistent with mindfulness.

Inconsistent with study predictions, none of the remaining facets (describing, acting with awareness, nonreactivity to inner experience) significantly predicted regulatory flexibility. To revisit Cronbach and Meehl, these null findings could be the result of the FFMQ as an inadequate measure of these facets. Although research has indicated that the FFMQ has the highest internal consistency and construct validity of all extant self-report measures of mindfulness, it also lacks evidence for content validity (e.g., Park et al., 2013). For instance, the

FFMQ has demonstrated expected relationships with measures of self-compassion, emotional intelligence, openness, well-being, anxiety, alexithymia, neuroticism, and dissociation (Baer et al., 2006; Barnes & Lynn, 2010; Cash & Whittingham, 2010; Fisak & von Lehe, 2012; Hollis-Walker & Colosimo, 2011; Lavender et al., 2011). However, previous research has found differential item functioning between meditators and nonmeditators (Van Dam et al., 2009). One reason for this might be because the FFMQ's items were not derived or informed from discussions, interviews, or focus groups with a target population (e.g., meditators), casting doubt on their relevance to the mindfulness construct (Park et al., 2013).

Cronbach and Meehl's second interpretation of these findings would suggest that the initial theory misinformed hypotheses. Study predictions were based on the premise that each mindfulness facet would synergistically enhance regulatory flexibility. However, in light of the unexpected findings that nonjudging may promote less sensitivity to context, thus interfering with the ability to choose a situation-appropriate regulatory strategy, it appears this facet may be a meaningful determinant of regulatory flexibility on its own. Stated differently, after accounting for nonjudging of inner experience, the remaining facets of present-centered attention, nonreactivity, and the ability to describe one's internal experiences may be unrelated to regulatory flexibility.

Cronbach and Meehl's third explanation for these null findings are that "the experimental design failed to test the hypothesis properly" (p. 295). Participants in the current study were not required to have any formal meditation training or experience. Previous research has found higher FFMQ scores among meditators as compared to non-meditating students, with meditation history positively correlated with total FFMQ scores (Van Dam et al., 2009). Thus, requiring

mindfulness meditation training or providing it by means of an induction task might have yielded more robust findings.

Limitations and Future Directions

The current study had several limitations. First, as previously stated, the laboratory task may not have accurately measured the use of distraction. Despite using distraction more often for high-intensity images, participants did not commit a significantly greater proportion of errors when viewing high-intensity images on the surprise memory test. These null findings are consistent with previous research (e.g., Hannan & Orcutt, 2015) and raise concerns regarding the putative mechanisms underpinning the use of distraction during the laboratory task (i.e., blocked information processing). Perhaps participants would have benefited from additional training and practice trials to improve their understanding of distraction and its implementation. However, this change may further limit the task's ecological validity, as extensive training on the "correct" way to use regulatory strategies implies that the task may not be measuring naturally occurring levels of regulatory flexibility. Second, the current laboratory task did not assess how participants' regulatory choices impacted their affect. Thus, although it is purported that differential use of reappraisal and distraction following low- and high-intensity images (respectively) is most adaptive (Sheppes et al., 2011), it is unclear whether these strategies effectively reduced participants' negative emotion. Future research may investigate the effect of each regulatory strategy by utilizing psychophysiological measures, such as heart rate and skin conductance. Third, although mindfulness facets were discussed as predictors of emotion regulatory flexibility, the cross-sectional design of this study precludes any firm conclusions

regarding directionality. That is, regulatory flexibility may predict mindfulness facets. Future research may investigate how these variables influence each other over time. Fourth, the current study's nonsignificant findings may be due to the study's small sample size. Consequently, insufficient statistical power may have inflated the Type II error rate, thereby obfuscating any true relationships that may exist between study variables (Cashen & Geiger, 2004). Lastly, the sample was comprised predominantly of White, female undergraduate students, and therefore might not be generalizable to the general population.

Conclusions

Emotion regulatory flexibility represents the ability to utilize a variety of regulatory strategies depending on the situation (Bonanno & Burton, 2013; Sheppes & Meiran, 2007; Sheppes et al., 2011). As research on regulatory flexibility continues to grow, it is important that researchers utilize a valid and reliable measure of this construct. Although the emotion regulation choice task has received support for its utility in measuring regulatory flexibility, the current study only partially supported previous findings by Sheppes et al. (2011). As expected, participants preferred reappraisal across most low-intensity trials and distraction across most high-intensity trials. However, surprise memory test performances were not significantly different between low- and high-intensity trials, indicating that participants were not implementing disengagement distraction. These results highlight the need to further investigate the emotion regulation choice task. For instance, this task may benefit from added training and/or practice trials.

Emotion regulation is a complex and multifaceted construct, and mindfulness facets may differentially influence its various components. The current study found that the mindfulness facet most relevant to emotion regulatory flexibility is nonjudging of inner experience. Specifically, this facet seems to promote greater insensitivity to context, such that individuals with higher levels of nonjudging may not adapt their regulatory strategies to meet the demands of specific situations. Provided the evidence that regulatory inflexibility is an important determinant of emotion dysregulation (Bonanno et al., 2011; Gupta & Bonanno, 2011; Kashdan & Rottenberg, 2010; Levy-Gigi et al., 2016; Troy & Mauss, 2011), this finding would suggest that nonjudging of inner experience might predispose individuals to developing psychopathology. However, the current study did not assess how regulatory flexibility predicted indices of affect or distress. Further, it is important to consider evidence that mindfulness reduces physiological reactivity (e.g., Arch & Craske, 2006, 2010; Brown et al., 2012; Creswell et al., 2014; Feldman et al., 2016), improves emotional differentiation (e.g., Hill & Updegraff, 2012), and facilitates unhinging from ruminative thinking styles (e.g., Farb et al., 2007; Way et al., 2010). Thus, it is possible that outside of the context of a forced-choice laboratory task, withholding judgment about a stressor and the resulting emotions may represent an appropriate emotion regulation strategy by itself. More specifically, individuals high in trait nonjudging may readily accept and defuse from the thoughts and emotions evoked by negative situations, obviating the need to appraise the situation to facilitate further attempts at down-regulating emotions (Chambers et al., 2009). Future studies may wish to investigate how nonjudging of inner experience, distraction, and reappraisal differentially influence emotional experiences and mental health.

REFERENCES

Aldao, A., Nolen-Hoeksema, S., & Schweizer, S. (2010). Emotion-regulation strategies across psychopathology: A meta-analytic review. *Clinical Psychology Review, 30*(2), 217-237. doi:10.1016/j.cpr.2009.11.004

Aldwin, C. (1994). *Stress, coping, and development*. New York, NY: Guilford Press.

Anicha, C. L., Ode, S., Moeller, S. K., & Robinson, M. D. (2012). Toward a cognitive view of trait mindfulness: Distinct cognitive skills predict its observing and nonreactivity facets. *Journal of Personality, 80*(2), 255-285. doi:10.1111/j.1467-6494.2011.00722.x

Arch, J. J., & Craske, M. G. (2006). Mechanisms of mindfulness: Emotion regulation following a focused breathing induction. *Behaviour Research and Therapy, 44*(12), 1849-1858. doi:10.1016/j.brat.2005.12.007

Arch, J. J., & Craske, M. G. (2010). Laboratory stressors in clinically anxious and non-anxious individuals: The moderating role of mindfulness. *Behaviour Research and Therapy, 48*(6), 495-505. doi:10.1016/j.brat.2010.02.005

Bach, P., & Hayes, C. (2002). The use of acceptance and commitment therapy to prevent the rehospitalization of psychotic patients: A randomized controlled trial. *Journal of Consulting and Clinical Psychology, 70*(5), 1129-1139. doi:10.1037//0022-006X.70.5.1129

Baer, R. A. (2003). Mindfulness training as a clinical intervention: A conceptual and empirical review. *Clinical Psychology: Science and Practice, 10*(2), 125-143. doi:10.1093/clipsy.bpg015

Baer, R. A., Smith, G. T., & Allen, K. B. (2004). Assessment of mindfulness by self-report. The Kentucky inventory of mindfulness skills. *Assessment, 11*(3), 191-206. doi:10.1177/1073191104268029

Baer, R. A., Smith, G. T., Hopkins, J., Krietemeyer, J., & Toney, L. (2006). Using self-report assessment methods to explore facets of mindfulness. *Assessment, 13*(1), 27-45. doi:10.1177/1073191105283504

Baer, R. A., Smith, G. T., Lykins, E., Button, D., Krietemeyer, J., Sauer, S., ... & Williams, J. M. G. (2008). Construct validity of the five-facet mindfulness questionnaire in meditating and nonmeditating samples. *Assessment, 15*(3), 329-342. doi:10.1177/1073191107313003

Barnes, S.M., & Lynn, S. J. (2010). Mindfulness skills and depressive symptoms: A longitudinal study. *Imagination, Cognition, and Personality, 30*(1), 77-91. doi:10.2190/IC.30.1.e

Barrett, L. F., & Gross, J. J. (2001). Emotional intelligence: A process model of emotion representation and regulation. In T. J. Mayne & G. A. Bonanno (Eds.), *Emotions: Current issues and future directions* (pp. 286-311). New York, NY: Guilford Press.

Barrett, L. F., Gross, J., Christensen, T. C., & Benvenuto, M. (2001). Knowing what you're feeling and knowing what to do about it: Mapping the relation between emotion differentiation and emotion regulation. *Cognition and Emotion, 15*(6), 713-724. doi:10.1080/02699930143000239

Beauregard, M., Levesque, J., & Bourgouin, P. (2001). Neural correlates of conscious self-regulation of emotion. *The Journal of Neuroscience, 21*(18), 6993-7000. Retrieved from http://psycnet.apa.org/psycinfo/2001-11499-001

Beck, A. T., Rush, A. J., Shaw, B. F., & Emery, D. (1979). *Cognitive therapy of depression*. New York, NY: Guilford Press.

Berking, M., & Wupperman, P. (2012). Emotion regulation and mental health: recent findings, current challenges, and future directions. *Current Opinion in Psychiatry, 25*(2), 128-134. doi:10.1097/YCO.0b013e3283503669

Bishop, S. R., Lau, M., Shapiro, S., Carlson, L., Anderson, N. D., Carmody, J., … & Devins, G. (2004). Mindfulness: A proposed operational definition. *Clinical Psychology: Science and Practice, 11*(3), 230-241. doi:10.1093/clipsy.bph077

Bonanno, G. A. (2001). Emotion self-regulation. In T. J. Mayne, & G. A. Bonanno (Eds.), *Emotions: Current issues and future directions* (pp. 251-285). New York, NY: Guilford Press.

Bonanno, G. A. (2005). Resilience in the face of potential trauma. *Current Directions in Psychological Science, 14*(3), 135-138. doi:10.1111/j.0963-7214.2005.00347.x

Bonanno, G. A., & Burton, C. L. (2013). Regulatory flexibility: An individual differences perspective on coping and emotion regulation. *Perspectives on Psychological Science, 8*(6), 591-612. doi:10.1177/1745691613504116

Bonanno, G. A., Papa, A., Lalande, K., Westphal, M., & Coifman, K. (2004). The importance of being flexible: The ability to both enhance and suppress emotional expression predicts long-term adjustment. *Psychological Science, 15*(7), 482-487. doi:10.1111/j.0956-7976.2004.00705.x

Bonanno, G. A., Pat-Horenczyk, R., & Noll, J. (2011). Coping flexibility and trauma: The perceived ability to cope with trauma (PACT) scale. *Psychological Trauma, 3*(2), 117-129. doi:10.1037/a0020921

Bradley, M. M., Codispoti, M., Cuthbert, B. N., & Lang, P. J. (2001). Emotion and motivation I: Defensive and appetitive reactions in picture processing. *Emotion, 1*, 276-298. doi:10.1037/1528-3542.1.3.276

Brown, K. W., Goodman, R. J., & Inzlicht, M. (2012). Dispositional mindfulness and the attenuation of neural responses to emotional stimuli. *Social Cognitive and Affective Neuroscience, 8*(1), 93-99. doi:10.1093/scan/nss004

Brown, K. W., & Ryan, R. M. (2003). The benefits of being present: Mindfulness and its role in psychological well-being. *Journal of Personality and Social Psychology, 84*(4), 822-848. doi:10.1037/0022-3514.84.4.822

Brown, K. W., & Ryan, R. M. (2004). Perils and promise in defining and measuring mindfulness: Observations from experience. *Clinical Psychology: Science and Practice, 11*(3), 242-248. doi:10.1093/clipsy/bph078

Brown, K. W., Weinstein, N., & Creswell, J. D. (2012). Trait mindfulness modulates neuro-endocrine and affective responses to social evaluative threat. *Psychoneuroendocrinology, 37*(12), 2037-2041. doi:10.1016/j.psyneuen.2012.04.003

Cash, M., & Whittingham, K. (2010). What facets of mindfulness contribute to psychological well-being and depressive, anxious, and stress-related symptomatology? *Mindfulness, 1*(3), 177-182. doi:10.1007/s12671-010-0023-4

Cashen, L. H., & Geiger, S. W. (2004). Statistical power and the testing of null hypotheses: A review of contemporary management research and recommendations for future studies. *Organizational Research Methods, 7*(2), 151-167.

Chambers, R., Gullone, E., & Allen, N. B. (2009). Mindful emotion regulation: An integrative review. *Clinical Psychology Review, 29*(6), 560-572. doi:10.1016/j.cpr.2009.06.005

Chambers, R., Lo, B. C. Y., & Allen, N. B. (2008). The impact of intensive mindfulness training on attentional control, cognitive style, and affect. *Cognitive Therapy and Research, 32*(3), 303-322. doi:10.1007/s10608-007-9119-0

Cheng, C. (2001). Assessing coping flexibility in real-life and laboratory settings: A multi-method approach. *Journal of Personality and Social Psychology, 80*(5), 814-833. doi:10.1037//0022-3514.80.5.814

Cisler, J. M., Olatunji, B. O., Feldner, M. T., & Forsyth, J. P. (2010). Emotion regulation and the anxiety disorders: An integrative review. *Journal of Psychopathology and Behavior Assessment, 32*(1), 68-82. doi:10.1007/s10862-009-9161-1

Cloitre, M., Miranda, R., Stovall-McClough, K. C., & Han, H. (2005). Beyond PTSD: Emotion regulation and interpersonal problems as predictors of functional impairment in survivors of childhood abuse. *Behavior Therapy, 36*(2), 119-124. doi:10.1016/S0005-7894(05)80060-7

Coan, J. A., Schaefer, H. S., & Davidson, R. J. (2006). Lending a hand: Social regulation of the neural response to threat. *Psychological Science, 17*(12), 1032-1039. doi:10.1111/j.1467-9280.2006.01832.x

Coffey, K. A., & Hartman, M. (2008). Mechanisms of action in the inverse relationship between mindfulness and psychological distress. *Complementary Health Practice Review, 13*(2), 79-91. doi:10.1177/1533210108316307

Cohen, J., Cohen, P., West, S. G., & Aiken, L. S. (2003). Applied Multiple Regression/ Correlation Analysis for the Behavioral Sciences (3rd ed.). Mahwah, NJ: Lawrence Erlbaum.

Cole, P. M., Martin, S. E., & Dennis, T. A. (2004). Emotion regulation as a scientific construct: Methodological challenges and directions for child development research. *Child Development, 75*(2), 317-333. doi:10.1111/j.1467-8624.2004.00673.x

Compas, B. E., Malcarne, V. L., & Fondacaro, K. M. (1988). Coping with stressful events in older children and young adolescents. *Journal of Consulting and Clinical Psychology, 56*(3), 241-258. doi:10.1037/0022-006X.56.3.405

Creswell, J. D., May, B. M., Eisenberger, N. I., & Lieberman, M. D. (2007). Neural correlates of dispositional mindfulness during affect labeling. *Psychosomatic Medicine, 69*(6), 560-565. doi:10.1097/PSY.0b013e3180f6171f

Creswell, J. D., Pacilio, L. E., Lindsay, E. K., & Brown, K. W. (2014). Brief mindfulness meditation training alters psychological and neuroendocrine responses to social evaluative stress. *Psychoneuroendocrinology, 44*, 1-12. doi:10.1016/j.psyneuen.2014.02.007

Cronbach, L. J., & Meehl, P. E. (1955). Construct validity in psychological tests. *Psychological Bulletin, 52*, 281-302. doi:10.1037/h0040957

Desbordes, G., Negi, L. T., Pace, T. W. W., Wallace, B. A., Raison, C. L., & Schwartz, E. L. (2012). Effects of mindful-attention and compassion meditation training on amygdala response to emotional stimuli in an ordinary, non-meditative state. *Frontiers in Human Neuroscience, 6*, 292-306. doi:10.3389/fnhum.2012.00292

Ehring, T., & Quack, D. (2010). Emotion regulation difficulties in trauma survivors: The role of trauma type and PTSD symptom severity. *Behavior Therapy, 41*(4), 587-598. doi:10.1016/j.beth.2010.04.004

Ehring, T., Tuschen-Caffier, B., Schnulle, J., Fischer, S., & Gross, J. J. (2010). Emotion regulation and vulnerability to depression: Spontaneous versus instructed use of emotion suppression and reappraisal. *Emotion, 10*(4), 563-572. doi:10.1037/a0019010

Eisenberger, N. I., Lieberman, M. D., & Williams, K. D. (2003). Does rejection hurt? An fMRI study of social exclusion. *Science, 302*(5643), 290-292. doi:10.1126/science.1089134

Evans, S., Ferrando, S., Findler, M., Stowell, C., Smart, C., & Haglin, D. (2008). Mindfulness-based cognitive therapy for generalized anxiety disorder. *Journal of Anxiety Disorders, 22*(4), 716-721. doi:10.1016/j.janxdis.2007.07.005

Farb, N. A. S., Segal, Z. V., Mayberg, H., Bean, J., McKeon, D., Fatima, Z., & Anderson, A. K. (2007). Attending to the present: mindfulness meditation reveals distinct neural modes of self-reference. *Social Cognitive and Affective Neuroscience*, *2*(4), 313-322. doi:10.1093/scan/nsm030

Faul, F., Erdfelder, E., Buchner, A., & Lang, A. G. (2009). Statistical power analyses using G*Power 3.1: Tests for correlation and regression analyses. *Behavior Research Methods, 41*, 1149-1160. doi:10.3758/BRM.41.4.1149

Feldman, G., Hayes, A., Kumar, S., Greeson, J., & Laurenceau, J. (2007). Mindfulness and emotion regulation: The development and initial validation of the cognitive and affective mindfulness scale-revised (CAMS-R). *Journal of Psychopathology and Behavioral Assessment, 29*, 177-190. doi:10.1007/s10862-006-9035-8

Feldman, G., Lavalle, J., Gildawie, K., & Greeson, J. M. (2016). Dispositional mindfulness uncouples physiological and emotional reactivity to a laboratory stressor and emotional reactivity to executive functioning lapses in daily life. *Mindfulness, 7*(2), 527-541. doi:10.1007/s12671-015-0487-3

Fisak, B., & von Lehe, A. C. (2012). The relation between the five facets of mindfulness and worry in a non-clinical sample. *Mindfulness*, *3*(1), 15-21. doi:10.1007/s12671-011-0075-0

Frewen, P. A., Evans, E. M., Maraj, N., Dozois, D. J., & Partridge, K. (2008). Letting go: Mindfulness and negative automatic thinking. *Cognitive Therapy and Research, 32*(6), 758-774. doi:10.1007/s10608-007-9142-1

Froeliger, B., Garland, E. L., Kozink, R. V., Modlin, L. A., Chen, N. K., McClernon, F. J., … & Sobin, Paul. (2012). Meditation-state functional connectivity (msFC): Strengthening of the dorsal attention network and beyond. *Evidence-Based Complementary and Alternative Medicine*, 2012. doi:10.1155/2012/680407

Füstös, J., Gramann, K., Herbert, B. M., & Pollatos, O. (2012). On the embodiment of emotion regulation: Interoceptive awareness facilitates reappraisal. *Social Cognitive and Affective Neuroscience*, *8*(8), 911-917. doi:10.1093/scan/nss089

Garland, E. L. (2007). The meaning of mindfulness: A second-order cybernetics of stress, metacognition, and coping. *Complementary Health Practice Review*, *12*(1), 15–30. doi:10.1177/1533210107301740

Garland, E. L., Fredrickson, B., Kring, A. M., Johnson, D. P, Meyer, P. S., & Penn, D. L. (2010). Upward spirals of positive emotions counter downward spirals of negativity: Insights from the broaden-and-build theory and affective neuroscience on the treatment of emotion dysfunctions and deficits in psychopathology. *Clinical Psychology Review*, *30*(7), 849-864. doi:10.1016/j.cpr.2010.03.002

Garland, E. L., Gaylord, S. A., & Fredrickson, B. L. (2011). Positive reappraisal mediates the stress-reductive effects of mindfulness: An upward spiral process. *Mindfulness*, *2*(1), 59-67. doi:10.1007/s12671-011-0043-8

Gaudiano, B., & Herbert, J. D. (2006). Acute treatment of inpatients with psychotic symptoms using acceptance and commitment therapy: Pilot results. *Behaviour Research and Therapy*, *44*, 415-437. doi:10.1016/j.brat.2005.02.007

Gintner, G. G., West, J. D., & Zarski, J. J. (1989). Learned resourcefulness and situation-specific coping with stress. *Journal of Psychology*, *123*(3), 295-304. doi:10.1080/00223980.1989.10542985

Gratz, K. L., & Roemer, L. (2004). Multidimensional assessment of emotion regulation and dysregulation: Development, factor structure, and initial validation of the difficulties in emotion regulation scale. *Journal of Psychopathology and Behavioral Assessment*, *26*(1), 41-54. doi:10.1007/s10862-008-9102-4

Greeson, J., Garland, E. L., & Black, D. (2014). *A transtherapeutic approach for transdiagnostic mental processes*. In A. Ie, C. T. Ngnoumen, & E. J. Langer (Eds.), *Wiley Blackwell handbook of mindfulness* (pp. 533-562). New York, NY: Wiley & Sons.

Gross, J. J. (1998a). Antecedent- and response-focused emotion regulation: Divergent consequences for experience, expression, and physiology. *Journal of Personality and Social Psychology*, *74*(1), 224-237. doi:10.1037/0022-3514.74.1.224

Gross, J. J. (1998b). The emerging field of emotion regulation: An integrative review. *Review of General Psychology*, *2*(3), 271-299. doi:10.1037/1089-2680.2.3.271

Gross, J. J. (2001). Emotion regulation in adulthood: Timing is everything. *Current Directions in Psychological Science*, *10*(6), 214-219. doi:10.1111/1467-8721.00152

Gross, J. J. (2002). Emotion regulation: Affective, cognitive, and social consequences. *Psychophysiology*, *39*(3), 281-291. doi:10.1017.S0048577201393198

Gross, J. J., & John, O. P. (2003). Individual differences in two emotion regulation processes: Implications for affect, relationships, and well-being. *Journal of Personality and Social Psychology, 85*(2), 348-362. doi:10.1037/0022-3514.85.2.348

Gu, J., Strauss, C., Crane, C., Barnhofer, T., Karl, A., Cavanagh, K., & Kuyken, W. (2016). Examining the factor structure of the 39-item and 15-item versions of the Five-Facet Mindfulness Questionnaire before and after mindfulness-based cognitive therapy for people with recurrent depression. *Psychological assessment, 28*(7), 791.

Gupta, S., & Bonanno, G. A. (2011). Complicated grief and deficits in emotional expressive flexibility. *Journal of Abnormal Psychology, 120*(3), 635-643. doi:10.1037/a0023541

Hannan, S. M., & Orcutt, H. K. (2015). Emotion regulation choice among undergraduate students with posttraumatic stress symptoms (Unpublished doctoral dissertation). Northern Illinois University, DeKalb.

Harenski, C. L., & Hamann, S. (2006). Neural correlates of regulating negative emotions related to moral violations. *Neuroimage, 30*(1), 313-324. doi:10.1016/j.neuroimage.2005.09.034

Hayes, S. C., & Shenk, C. (2004). Operationalizing mindfulness without unnecessary attachments. *Clinical Psychology: Science and Practice, 11*(3), 249-254. doi:10.1093/clipsy.bph079

Hayes, S. C., Strosahl, K., & Wilson, K. G. (1999). *Acceptance and commitment therapy: An experiential approach to behavior change*. New York, NY: Guilford Press.

Hayes, S. C., & Wilson, K. G. (2003). Mindfulness: Method and process. *Clinical Psychology Science and Practice, 10*(2), 161-165. doi:10.1093/clipsy/bpg018

Herry, C., Bach, D. R., Esposito, F., Di Salle, F., Perrig, W. J., Scheffler, K., ... & Seifritz, E. (2007). Processing of temporal unpredictability in human and animal amygdala. *Journal of Neuroscience, 27*(22), 5958-5966. doi:10.1523/JNEUROSCI.5218-06.2007

Hill, L. M. C., & Updegraff, A. J. (2012). Mindfulness and its relationship to emotion regulation. *Emotion*, *12*(1), 81-90. Retrieved from http://dx.doi.org/10.1037/a0026355

Hollis-Walker L, Colosimo K. (2011). Mindfulness, self-compassion, and happiness in non-meditators: A theoretical and empirical examination. *Personality and Individual Differences, 50*(2), 222-227. doi:10.1016/j.paid.2010.09.033

Hubner, R., Steinhauser, M., & Lehle, C. (2010). A dual-stage two-phase model of selective attention. *Psychological Review, 117*(3), 759-784. doi:10.1037/a0019471

Jha, A. P., Krompinger, J., & Baime, M. J. (2007). Mindfulness training modifies subsystems of attention. *Cognitive, Affective, and Behavioral Neuroscience, 7*(2), 109-119. doi:10.3758/CABN.7.2.109

John, O. P., & Gross, J. J. (2004). Healthy and unhealthy emotion regulation: Personality processes, individual differences, and life span development. *Journal of Personality, 72*(6), 1301-1334. doi:10.1111/j.1467-6494.2004.00298.x

Johnston, W. A., & Heinz, S. P. (1978). Flexibility and capacity demands of attention. *Journal of Experimental Psychology: General, 107*(4), 420-435. doi:10.1037/0096-3445.107.4.420

Kabat-Zinn, J. (1994). *Full catastrophe living: Using the wisdom of your body and mind to face stress, pain and illness*. New York, NY: Delacourt.

Kabat-Zinn, J., Massion, A. O., Kristeller, J., Peterson, L. G., Fletcher, K. E., Pbert, L., ... & Santorelli, S. K. (1992). Effectiveness of a meditation-based stress reduction program in the treatment of anxiety disorders. *American Journal of Psychiatry*, *149*(7), 936-943. doi:10.1176/ajp.149.7.936

Kalisch, R. (2009). The functional neuroanatomy of reappraisal: Time matters. *Neuroscience and Biobehavioral Reviews, 33*(8), 1215-1226. doi:10.1016/j.neubiorev.2009 .06.003

Kalisch, R., Wiech, K., Critchley, H. D., Seymour, B., O'Doherty, J. E., Oakley, D. A., ... & Dolan, R. J. (2005). Anxiety reduction through detachment: subjective, physiological, and neural effects. *Journal of Cognitive Neuroscience, 17*(6), 874-883. doi:10.1162/0898929054021184

Kashdan, T. B., & Rottenberg, J. (2010). Psychological flexibility as a fundamental aspect of health. *Clinical Psychology Review, 30*(7), 865-878. doi:10.1016/j.cpr.2010.03.001

King, A. P., Block, S. R., Sripada, R. K., Rauch, S., Giardino, N., Favorite, T., ... & Liberzon, I. (2016). Altered default mode network (DMN) resting state functional connectivity following a mindfulness-based exposure therapy for posttraumatic stress disorder (PTSD) in combat veterans of Afghanistan and Iraq. *Depression and Anxiety, 33*(4), 289-299. doi:10.1002/da.22481

Kring, A. M., & Sloan, D. M. (Eds.). (2010). *Emotion regulation and psychopathology: A transdiagnostic approach to etiology and treatment*. New York, NY: Guilford Press.

Kron, A., Schul, Y., Cohen, A., & Hassin, R. (2010). Feelings don't come easy: Studies on the effortful nature of feelings. *Journal of Experimental Psychology: General, 139*(3), 520-534. doi:10.1037/a0020008

Kross, E., Berman, M. G., Mischel, W., Smith, E. E., & Wager, T. D. (2011). Social rejection shares somatosensory representations with physical pain. *Proceedings of the National Academy of Sciences, 108*(15), 6270-6275. doi:10.1073/ pnas.1102693108

Kumar, S., Feldman, G., & Hayes, A. (2008). Changes in mindfulness and emotion regulation in an exposure-based cognitive therapy for depression. *Cognitive Therapy Research, 32*(6), 734-744. doi:10.1007/s10608-008-9190-1

Lam, C., & McBride-Chang, C. (2007). Resilience in young adulthood: The moderating influences of gender-related personality traits and coping flexibility. *Sex Roles, 56*(3), 159-172. doi:10.1007/s11199-006-9159-z

Lang, P. J., Bradley, B. N., & Cuthbert, B. N. (2008). *International Affective Picture System (IAPS): Affective ratings of pictures and instruction manual* (Technical Report No. A-8). Gainesville: University of Florida.

Lavender, J. M., Gratz, K.L., Tull, M.T. (2011). Exploring the relationship between facets of mindfulness and eating pathology in women. *Cognitive Behaviour Therapy, 40*(3), 174-182. doi: 10.1080/16506073.2011.555485

Levy-Gigi, E., Bonanno, A. G., Shapiro, R. A., Richter-Levin, G., Keri, S., & Sheppes, G. (2016). Emotion regulatory flexibility sheds light on the elusive relationship between repeated traumatic exposure and posttraumatic stress disorder symptoms. *Clinical Psychological Science*, *4*(10), 28-39. doi:10.1177/2167702615577783

Lieberman, M. D., Eisenberger, N. I., Crockett, M. J., Tom, S. M., Pfeifer, J. H., & Way, B. M. (2007). Putting feelings into words. Affect labeling disrupts amygdala activity in response to affective stimuli. *Psychological Science, 18*(5), 421-428. doi:10.1111/j.1467-9280.2007.01916.x

Linehan, M. M. (1993). Cognitive-behavioral treatment for borderline personality disorder. New York, NY: Guilford Press.

Lougheed, J. P., & Hollenstein, T. (2012). A limited repertoire of emotion regulation strategies is associated with internalizing problems in adolescence. *Social Development*, *21*(4), 704-721. http://dx.doi.org/10.1111/j.1467-9507.2012.00663.x

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. doi:10.1016/j.tics.2008.01.005

Lynch, T. R., Trost, W. T., Salsman, N., & Linehan, M. M. (2007). Dialectical behavior therapy for borderline personality disorder. *Annual Review of Clinical Psychology, 3*, 181-205. doi:10.1146/annurev.clinpsy.2.022305.095229

Ma, S. H., & Teasdale, J. D. (2004). Mindfulness-based cognitive therapy for depression: Replication and exploration of differential relapse prevention effects. *Journal of Consulting and Clinical Psychology, 72*(1), 31. doi:10.1037/0022-006X.72.1.31

Mandal, S. P., Arya, Y. K., & Pandey, R. (2014). Understanding emotion regulatory effect of mindfulness: Role of differentiation and range of emotional experiences. *Indian Journal of Positive Psychology*, *5*(4), 356-362. Retrieved from http://search.proquest.com/openview/85bf9ace1dc7a75c875eec9be55f443d/1?pq-origsite=gscholar

McRae, K., Hughes, B., Chopra, S., Gabrieli, J. J. D., Gross, J. J., & Ochsner, K. N. (2010). The neural correlates of cognitive reappraisal and distraction: An fMRI study of emotion regulation. *Journal of Cognitive Neuroscience*, *22*, 248-262. doi:10.1162/jocn.2009.21243

Miller, S. M. (1992). Individual differences in the coping process: What to know and when to know it. In B. N. Carpenter (Ed.), *Personal coping: Theory, research, application* (pp. 77-91). Westport, CT: Praeger.

Miller, J. J., Fletcher, K., & Kabat-Zinn, J. (1995). Three-year follow-up and clinical implications of a mindfulness meditation-based stress reduction intervention in the treatment of anxiety disorders. *General Hospital Psychiatry*, *17*(3), 192-200. doi:10.1016/0163-8343(95)00025-M

Modinos, G., Ormel, J., & Aleman, A. (2010). Individual differences in dispositional mindfulness and brain activity involved in reappraisal of emotion. *Social Cognitive and Affective Neuroscience*, *5*(4), 369-377. doi:10.1093/scan/nsq006

Moore, A., & Malinowski, P. (2009). Meditation, mindfulness and cognitive flexibility. *Consciousness and Cognition*, *18*(1), 176-186. doi:10.1016/j.concog.2008.12.008

Nolen-Hoeksema, S. (2000). The role of rumination in depressive disorders and mixed anxiety/depressive symptoms. *Journal of Abnormal Psychology*, *109*(3), 504-511. doi:10.1037/0021-843X.109.3.504

Ochsner, K. N., Bunge, S. A., Gross, J. J., & Gabrieli, J. D. (2002). Rethinking feelings: An fMRI study of the cognitive regulation of emotion. *Journal of Cognitive Neuroscience, 14*(8), 1215-1229. doi:10.1162/089892902760807212

Ochsner, K. N., Ray, R. D., Cooper, J. C., Robertson, E. R., Chopra, S., Gabrieli, J. D., & Gross, J. J. (2004). For better or for worse: Neural systems supporting the cognitive down-and up-regulation of negative emotion. *Neuroimage, 23*(2), 483-499. doi:10.1016/j.neuroimage.2004.06.030

Ohira, H., Nomura, M., Ichikawa, N., Isowa, T., Iidaka, T., Sato, A., ... & Yamada, J. (2006). Association of neural and physiological responses during voluntary emotion suppression. *Neuroimage*, *29*(3), 721-733. doi:10.1016/j.neuroimage.2005.08.047

O'Neill, S. C., Cohen, L. H., Tolpin, L. H., & Gunthert, K. C. (2004). Affective reactivity to daily interpersonal stressors as a prospective predictor of depressive symptoms. *Journal of Social and Clinical Psychology*, *23*(2), 172. Retrieved from http://www.ulib.niu.edu:2345/ehost/pdfviewer/pdfviewer?sid=59f26380-b29a-4993-9035-69a103d0c46a%40sessionmgr4002&vid=1&hid=4207

Orcutt, H. K., Bonanno, G. A., Hannan, S. M., & Miron, L. R. (2014). Prospective trajectories of posttraumatic stress in college women following a campus mass shooting. *Journal of Traumatic Stress, 27*(3), 249-256. doi:10.1002/jts.21914

Paret, C., Brenninkmeyer, J., Meyer, B., Yuen, K. S. L., Gartmann, N., Mechias, M. L., & Kalisch, R. (2011). A test for the implementation-maintenance model of reappraisal. *Frontiers in Psychology, 2*(216), 146-158. doi:10.3389/fpsyg.2011.00216

Park, T., Reilly-Spong, M., & Gross, C. R. (2013). Mindfulness: A systematic review of instruments to measure an emergent patient-reported outcome (PRO). *Quality of Life Research, 22*(10), 2639-2659. doi:10.1007/s11136-013-0395-8

Parrish, B. P., Cohen, L. H., & Laurenceau, J. P. (2011). Prospective relationship between negative affective reactivity to daily stress and depressive symptoms. *Journal of Social and Clinical Psychology, 30*(3), 270. doi:10.1521/jscp.2011.30.3.270

Pashler, H. (1998). *The psychology of attention.* Cambridge, MA: MIT Press.

Piet, J., & Hougaard, E. (2011). The effect of mindfulness-based cognitive therapy for prevention of relapse in recurrent major depressive disorder: A systematic review and meta-analysis. *Clinical Psychology Review, 31*, 1032-1040. doi:10.1016/ j.cpr.2011.05.002

Richards, J. M., & Gross, J. J. (2000). Emotion regulation and memory: The cognitive costs of keeping one's cool. *Journal of Personality and Social Psychology, 79*(3), 410-424. doi:10.1037/0022-3514.79.3.410

Roberts, N. A., Levenson, R. W., & Gross, J. J. (2008). Cardiovascular costs of emotion suppression cross ethnic lines. *International Journal of Psychophysiology, 70*(1), 82-87. doi:10.1016/j.ijpsycho.2008.06.003

Roemer, L., Lee, J. K., Salters-Pedneault, K., Erisman, S. M., Orsillo, S. M., & Mennin, D. S. (2009). Mindfulness and emotion regulation difficulties in generalized anxiety disorder: Preliminary evidence for independent and overlapping contributions. *Behavior Therapy, 40*(2), 142-154. doi:10.1016/j.beth.2008.04.001

Roemer, L., & Orsillo, S. M. (2003). Mindfulness: A promising intervention strategy in need of further study. *Clinical Psychology, 10*(2), 172-178. doi:10.1093/clipsy.bpg020

Safran, J. D., & Segal, Z. V. (1990). *Interpersonal process in cognitive therapy*. New York, NY: Basic Books.

Schneiders, J., Nicolson, N. A., Berkhof, J., Feron, F. J., van Os, J., & deVries, M. W. (2006). Mood reactivity to daily negative events in early adolescence: Relationship to risk for psychopathology. *Developmental Psychology, 42*(3), 543. doi:10.1037/0012-1649.42.3.543

Shapiro, S. L., Carlson, L. E., Astin, J. A., & Freedman, B. (2006). Mechanisms of mindfulness. *Journal of Clinical Psychology*, *62*(3), 373-386. doi:10.1002/jclp.20237

Sheppes, G., & Gross, J. J. (2011). Is timing everything? Temporal considerations in emotion regulation. *Personality and Social Psychology Review*, *15*(4), 319-331. doi:10.1177/1088868310395778

Sheppes, G., & Meiran, N. (2007). Better late than never? On the dynamics of on-line regulation of sadness using distraction and cognitive reappraisal. *Personality and Social Psychology Bulletin*, *33*(11), 1518-1532. doi:10.1177/0146167207305537

Sheppes, G., & Meiran, N. (2008). Divergent cognitive costs for online forms of reappraisal and distraction. *Emotion*, *8*(6), 870-874. doi:10.1037/a0013711

Sheppes, G., Scheibe, S., Suri, G., & Gross, J. J. (2011). Emotion-regulation choice. *Psychological Science*, *22*(11), 1391-1396. doi:10.1177/0956797611418350

Sheppes, G., Scheibe, S., Suri, G., Radu, P., Blechert, J., & Gross, J. J. (2014). Emotion regulation choice: A conceptual framework and supporting evidence. *Journal of Experimental Psychology: General*, *143*(1), 163-181. doi:10.1037/a0030831

Siegel, D. J. (2007). Mindfulness training and neural integration: Differentiation of distinct streams of awareness and the cultivation of well-being. *Social Cognitive and Affective Neuroscience*, *2*(4), 259-263. doi:10.1093/scan/nsm034

Siegling, A. B., & Petrides, K. V. (2016). Zeroing in on mindfulness facets: Similarities, validity, and dimensionality across three independent measures. *PloS one*, *11*(4), e0153073.

Smith, E. E., & Jonides, J. (1999). Storage and executive processes in the frontal lobes. *Science*, *283*(5408), 1657-1661. Retrieved from http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.588.9717&rep=rep1&type=pdf

Srivastava, S., Tamir, M., McGonigal, K. M., John, O. P., & Gross, J. J. (2009). The social costs of emotional suppression: A prospective study of the transition to college. *Journal of Personality and Social Psychology*, *96*(4), 883-897. doi:10.1037/a0014755

Sujato, B. (2005). *A history of mindfulness: How insight worsted tranquility in the Satipatthana Sutta*. Taiwan: Buddha Educational Foundation.

Tabachnick, B. G., & Fidell, L. S. (2013). *Using multivariate statistics* (6th ed.). Needham Heights, MA: Allyn & Beacon.

Teasdale, J. D., Segal, Z. V., Williams, J. M. G., Ridgeway, V. A., Soulsby, 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. doi:10.1037//0022-006X.68.4.615

Teper, R., & Inzlicht, M. (2013). Meditation, mindfulness, and executive control: The importance of emotional acceptance and brain-based performance monitoring. *Social Cognitive and Affective Neuroscience*, *8*(1), 85-92. doi:10.1093/scan/nss045

Thompson, R. A. (1994). Emotion regulation: A theme in search of definition. *Monographs of the Society for Research in Child Development*, *59*(2-3), 25-52. doi:10.1111/j.1540-5834.1994.tb01276.x

Troy, A. S., & Mauss, I. B. (2011). Resilience in the face of stress: Emotion regulation as a protective factor. In S. M. Southwick, B. T. Litz, D. Charney, & M. J. Friedman (Eds.), *Resilience and mental health: Challenges across the lifespan* (pp. 30-44). Retrieved from https://www.ocf.berkeley.edu/~eerlab/pdf/papers/2011_Troy_Resilience_in_the_face_of_stress.pdf

Urry, H. L., Van Reekum, C. M., Johnstone, T., Kalin, N. H., Thurow, M. E., Schaefer, H. S., ... & Davidson, R. J. (2006). Amygdala and ventromedial prefrontal cortex are inversely coupled during regulation of negative affect and predict the diurnal pattern of cortisol secretion among older adults. *The Journal of Neuroscience*, *26*(16), 4415-4425. doi:10.1523/JNEUROSCI.3215-05.2006

Van Dam, N. T., Earleywine, M., & Danoff-Burg, S. (2009). Differential item function across meditators and non-meditators on the Five-Facet Mindfulness Questionnaire. *Personality and Individual Differences*, *47*(5), 516-521. doi:10.1016/j.paid.2009.05.005

Van den Hurk, P., Janssen, B., Giommi, F., Barendregt, H., & Gielen, S. (2010). Mindfulness meditation associated with alterations in bottom-up processing: Psychophysiological evidence for reduced reactivity. *International Journal of Psychophysiology*, *78*(2), 151-157. doi:10.1016/ j.ijpsycho.2010.07.002

Van Dillen, L. F., & Koole, S. L. (2007). Clearing the mind: A working memory model of distraction from negative mood. *Emotion*, *7*(4), 715-723. doi:10.1037/1528-3542.7.4.715

Watkins, E., & Teasdale, J. D. (2001). Rumination and overgeneral memory in depression: Effects of self-focus and analytic thinking. *Journal of Abnormal Psychology*, *110*(2), 353. doi:10.1037/0021-843X.110.2.333

Way, B. M., Creswell, J. D., Eisenberger, N. I., & Lieberman, M. D. (2010). Dispositional mindfulness and depressive symptomatology: Correlations with limbic and self-referential neural activity during rest. *Emotion*, *10*(1), 12. doi:10.1037/a0018312

Weinberg, A., & Hajcak, G. (2010). Beyond good and evil: The time course of neural activity elicited by specific picture content. *Emotion*, *10*, 767-782. doi:10.1037/a0020242

Wenk-Sormaz, H. (2005). Meditation can reduce habitual responding. *Alternative Therapies*, *11*(2), 42-58. Retrieved from http://search.proquest.com/openview/bf0899be1f7e0349e333fa6d5bf32cb4/1?pq-origsite=gscholar

Williams, M. J., Dalgleish, T., Karl, A., & Kuyken, W. (2014). Examining the factor structures of the Five-Facet Mindfulness Questionnaire and the self-compassion scale. *Psychological assessment*, *26*(2), 407.

Williams, M. N., Grajales, C. A. G., & Kurkiewicz, D. (2013). Assumptions of multiple regression: Correcting two misconceptions. *Practical Assessment, Research, and Evaluation*, *18*(11), 2. Retrieved from http://pareonline.net/getvn.asp?v=18&n=11

Zeidan, F., Martucci, K. T., Krafy, R. A., McHaffie, J. G., & Coghill, R. C. (2013). Neural correlates of mindfulness meditation-related anxiety relief. *Social Cognitive and Affective Neuroscience*, *9*(6), 751-759. doi:10.1093/scan/nst041

APPENDIX A

DEMOGRAPHICS QUESTIONNAIRE

1. What is your gender?
    a. Male
    b. Female

2. What is your date of birth? _____/_____/_____
    Month Day Year

3. Do you identify as Latino, Hispanic, or being of Spanish origin (please select one)?
    a. Yes
    b. No
    c. Prefer not to respond

4. What is your race (please select one)?
    a. American Indian or Alaskan Native
    b. Asian or South-Asian
    c. Black or African American
    d. Native Hawaiian or Pacific Islander
    e. White
    f. Other (please specify) _____
    g. Prefer not to respond

5. How many years of education have you completed?
    a. _____ Years of education
    b. Prefer not to respond

6. Which year in school are you?
    a. Freshman
    b. Sophomore
    c. Junior
    d. Senior
    e. Graduate
    f. Other (please specify) _____
    g. Prefer not to respond

7. What is your legal marital status?
    a. Single
    b. Married or equivalent (e.g., civil union)
    c. Divorced
    d. Widowed
    e. Prefer not to respond

8. What is your relationship status?
    a. Engaged
    b. Living with someone
    c. Dating seriously
    d. Dating casually
    e. Not involved
    f. Prefer not to respond

9. What is your best guess of your family's income last year?
    a. Under $10,000
    b. $10,000 - $14,999
    c. $15,000 - $24,999
    d. $25,000 - $34,999
    e. $35,000 - $49,999
    f. $50,000 - $74,999
    g. $75,000 or more
    h. Prefer not to respond

APPENDIX B

FIVE-FACET MINDFULNESS QUESTIONNAIRE

Please rate each of the following statements using the scale provided. Write the number in the blank that best describes your own opinion of what is generally true for you.

1	2	3	4	5
never or very rarely true	rarely true	sometimes true	often true	very often or always true

_____ 1. When I'm walking, I deliberately notice the sensations of my body moving.

_____ 2. I'm good at finding words to describe my feelings.

_____ 3. I criticize myself for having irrational or inappropriate emotions.

_____ 4. I perceive my feelings and emotions without having to react to them.

_____ 5. When I do things, my mind wanders off and I'm easily distracted.

_____ 6. When I take a shower or bath, I stay alert to the sensations of water on my body.

_____ 7. I can easily put my beliefs, opinions, and expectations into words.

_____ 8. I don't pay attention to what I'm doing because I'm daydreaming, worrying, or otherwise distracted.

_____ 9. I watch my feelings without getting lost in them.

_____ 10. I tell myself I shouldn't be feeling the way I'm feeling.

_____ 11. I notice how foods and drinks affect my thoughts, bodily sensations, and emotions.

_____ 12. It's hard for me to find the words to describe what I'm thinking.

_____ 13. I am easily distracted.

_____ 14. I believe some of my thoughts are abnormal or bad and I shouldn't think that way.

_____ 15. I pay attention to sensations, such as the wind in my hair or sun on my face

_____ 16. I have trouble thinking of the right words to express how I feel about things.

_____ 17. I make judgments about whether my thoughts are good or bad.

_____ 18. I find it difficult to stay focused on what's happening in the present.

_____ 19. When I have distressing thoughts or images, I "step back" and am aware of the thought or image without getting taken over by it.

_____ 20. I pay attention to sounds, such as clocks ticking, birds chirping, or cars passing.

_____ 21. In difficult situations, I can pause without immediately reacting.

_____ 22. When I have a sensation in my body, it's difficult for me to describe it because I can't find the right words.

_____ 23. It seems I am "running on automatic" without much awareness of what I'm doing.

_____24. When I have distressing thoughts or images, I feel calm soon after.

_____ 25. I tell myself that I shouldn't be thinking the way I'm thinking.

_____ 26. I notice the smells and aromas of things.

_____ 27. Even when I'm feeling terribly upset, I can find a way to put it into words.

_____ 28. I rush through activities without being really attentive to them.

_____ 29. When I have distressing thoughts or images I am able just to notice them without reacting.

_____ 30. I think some of my emotions are bad or inappropriate and I shouldn't feel them.

_____ 31. I notice visual elements in art or nature, such as colors, shapes, textures, or patterns of light and shadow.

_____ 32. My natural tendency is to put my experiences into words.

_____ 33. When I have distressing thoughts or images, I just notice them and let them go.

_____ 34. I do jobs or tasks automatically without being aware of what I'm doing.

_____ 35. When I have distressing thoughts or images, I judge myself as good or bad, depending what the thought/image is about.

_____ 36. I pay attention to how my emotions affect my thoughts and behavior.

_____ 37. I can usually describe how I feel at the moment in considerable detail.

_____ 38. I find myself doing things without paying attention.

_____ 39. I disapprove of myself when I have irrational ideas.