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Decentering From Distress In The Moment: A Brief Randomized Control Trial

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DECENTERING FROM DISTRESS IN THE MOMENT: A BRIEF RANDOMIZED CONTROL TRIAL

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Sheila Kay Hanson
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ABSTRACT

The utility of mindfulness techniques to regulate emotions and enhance distress tolerance is an area of expanding research interest. Decentering, a mindfulness mechanism believed to exert therapeutic influence, is the realization that thoughts, feelings, and reactions are transitory patterns of mental activity. Existing research indicates that decentering may occur through brief mindfulness interventions. Most studies concerning brief mindfulness induce a state of mindfulness prior to a task to examine its influence on dependent variables, such as cognitive or emotional outcomes after mindfulness. This study is novel and fills a gap in the literature regarding the utility of inducing state mindfulness both before and after a distressing task for producing state mindfulness, subjective distress, positive affect, and negative affect.

Undergraduate student participants were randomly assigned either to a control group or one of three intervention groups: (1) preventive mindfulness before a laboratory distress task; (2) recovery mindfulness after a distress task; or (3) preventive mindfulness before and recovery mindfulness after a distress task. The distress task was a neuropsychological test, specifically the Paced Auditory Serial Addition Task (PASAT). This challenging task is typically used to assess attentional processing, immediate memory, and attention; however, in the current study, it was utilized as a laboratory stressor.

The overall results indicated that preventive mindfulness produces higher state mindfulness and less subjective distress but no differences in negative or positive affect when compared to a control group. Recovery mindfulness resulted in higher state mindfulness,

increased positive affect and decreased subjective distress but not lower negative affect when compared to a control group. The cumulative effect of preventive and recovery mindfulness resulted in higher state mindfulness, higher positive affect, and less subjective distress but not lower negative affect when compared to a control group. Furthermore, the results of a series of mixed model ANOVAs of time x group are also reported on the same outcome measures. These results are discussed in light of clinical implications. Finally, limitations and directions for future research are discussed.

Keywords: brief mindfulness, emotion regulation, distress tolerance, mental health, psychological functioning

CHAPTER I

INTRODUCTION

Under stressful conditions, the ability to tolerate distress and regulate emotions are crucial to psychological functioning and well-being. In many manifestations of psychopathology, difficulties tolerating distress and regulating emotions contribute to the maintenance of psychopathology. Hence, improving emotion regulation and distress tolerance are frequently the aims of intervention in clinical settings to effect change. One method to do so is through mindfulness as both a prevention and intervention strategy. Furthermore, regulating emotion and tolerating distress in non-clinical populations is also important in many stress-inducing situations that occur in an individual's home, community, and work settings. Thus, the importance and potential of interventions to improve emotion regulation and distress tolerance are far reaching.

Mindfulness techniques as a means to regulate emotion and increase distress tolerance are an area of existing and expanding interest which has been widely researched and practically applied. In simple terms, mindfulness, known as present-centered attention and awareness (Brown & Ryan, 2003), is a rapidly growing area of inquiry with thousands of scholarly articles published on the topic (van Dam, 2018). In various settings, functioning with present centered attention and awareness induces a state of well-being. By contrast, individuals may worry and feel apprehensive about a feared future (e.g., anxiety) or ruminate about the past (e.g., depression). Thus, focusing on the past or the future may precipitate maladaptive functioning and distress; conversely, attending to the present may facilitate more adaptive functioning. The

rationale for both past research and the present study of mindfulness—at the broadest level—is that

mindfulness appears to positively influence human functioning (Brown, Ryan, & Creswell, 2007; Good et al, 2016). Diverse disciplines (i.e., psychology, neuroscience, medicine, and business) have provided substantial evidence that mindfulness enhances human functioning in the areas of attention, cognition, emotions, behavior, and physiology.

Mindfulness interventions are common in clinical settings for both one-on-one interventions and group therapy to improve mental health and reduce distress. Integrated health care settings (Schütze et al., 2014) and large organizations such as Google, Mayo Clinic, and the Armed Forces use mindfulness training to improve psychological and physical functioning (Good et al., 2016; Tan, Lo, & Macrae, 2014; West et al., 2014; Wolever et al., 2012). Mindfulness is applicable particularly in distressing conditions and adverse contexts which benefit both clinical and non-clinical populations. Though longer-term mindfulness training appears to be efficacious, understanding the effects of brief mindfulness interventions is pivotal to introduce potential benefits of mindfulness in diverse contexts, including mental health, primary care, and other organizational settings. The goal of the current study is to assess the potential of brief mindfulness interventions to induce state mindfulness, reduce subjective distress, and influence affect.

Distress Tolerance

Distress tolerance refers to a capacity to withstand distress related to aversive affective, cognitive, and/or physical states (Leyro, Zvolensky, & Bernstein, 2010). Furthermore, distress tolerance promotes the willingness and ability to tolerate adverse experiences and negative emotions. In contrast, when individuals exhibit difficulties with distress tolerance, they tend to employ avoidance behaviors, control, and down-regulation of negative emotions rather than attempting to tolerate and process distress (Leyro et al., 2010). Through experiential avoidance,

individuals avoid distress and temporarily improve their mood, while negatively reinforcing the notion that the distress is intolerable (Simons & Gaher, 2005; Zvolensky, Vujanovic, Bernstein, & Leyro, 2010). In addition, difficulties tolerating distress may affect processes that facilitate maladaptive behavior, such as attending to potential emotional threat cues, appraisals of distress, and behavioral responses (e.g., avoidance) to distress (Leyro et al., 2010; Simons & Gaher, 2005). Difficulties tolerating distress (i.e., distress intolerance) are believed to contribute to the development and maintenance of psychopathology (Paz, Zvielli, Goldstein, & Bernstein, 2017). Distress intolerance has been hypothesized to encourage avoidant coping due to the perceived aversiveness of negative emotional states (McHugh et al., 2013). Moreover, distress intolerance is an important factor in the development and maintenance of substance abuse (Brown, Lejueuz, Kahler, & Strong, 2002; Buckner, Keough, & Schmidt, 2007; Dennhardt & Murphy, 2011), anxiety (Michel, Rowa, Young, & McCabe), smoking (Luberto & McLeish, 2018), eating disorders (Yiu, Christensen, Arlt, & Chen, 2018), and posttraumatic stress (Tull, Barrett, McMillan, & Roemer, 2007). Interventions targeting the means for individuals to increase distress tolerance have demonstrated successful outcomes in clinical trials (Bornovalova, Gratz, Daughters, Hunt, & Lejuez, 2012) and have been employed in numerous evidence-based treatments, such as Acceptance and Commitment Therapy (ACT; Hayes, Strosahl, & Wilson 1999), Dialectical Behavioral Therapy (DBT; Linehan & Wilks, 2015), and Mindfulness-Based Cognitive Therapy (MBCT; Segal, Williams & Teasdale, 2012).

The current study focuses on a specific type of distress tolerance as an individual's ability to withstand negative emotional states (Simons & Gaher, 2005). Researchers posited that affective distress tolerance is a multidimensional concept involving both the individual's anticipation of negative emotion and their actual experience with negative emotion (Simons &

Gaher, 2005). Thus, they developed a measure of the following facets of distress tolerance: ability to tolerate, assessment of the emotional situation as acceptable, how the individual regulates emotion, how much attention is absorbed by the negative emotion and to what degree it interferes with functioning.

Individuals with low levels of distress tolerance typically perceive themselves as unable to tolerate negative emotions. In addition to avoidance strategies, they may engage in other maladaptive behaviors (e.g., substance use, disordered eating) as a means to regulate emotions; thus, at least temporarily, they may avoid or reduce distress (Bornovalova et al., 2012). Moreover, distress intolerance is often conceptualized as a trait-like variable which is a risk factor for psychopathology (Simons & Gaher, 2005). Importantly, theoretical models of distress tolerance suggest that it may change over time; increasing distress tolerance is often the target of intervention (Bornovalova et al., 2012).

Distress Tolerance, Emotional Regulation, and Attention

Remarkably, distress tolerance is also perceived as a protective factor associated with resilience (Nila, Holt, Ditzen, & Aguilar-Raab, 2016). Specifically, distress tolerance is a protective factor in the development of psychopathology such as Posttraumatic Stress Disorder (Fetzner, Peluso, & Asmundson, 2014); it also plays a role in the maintenance of psychopathology, as demonstrated by participants dropping out of substance use treatments (Daughters et al., 2005). Furthermore, research has proven that attentional control—the skillful control of higher-order executive attention in regulating bottom-up emotional responses—may be an effective means of regulating distress (Bardeen, Tull, Dixon-Gordon, Stevens, & Gratz, 2015). Using a community sample of adults, Bardeen et al. (2015) assessed executive attention, a measure of attentional control, using a laboratory measure called the Attention Network Test

(ANT; Fan, McCandliss, Sommer, Raz, & Posner, 2002). Participants saw two combinations of arrows on the computer screen: incongruent (←←←→←←) and congruent (←←←←←←). Participants were instructed to indicate the direction of the central arrow on the screen quickly and accurately by pressing the corresponding button on the computer keyboard. After 24 practice trials and 288 experimental trials, an executive attention scale score was calculated by subtracting mean response times (RTs) of the congruent trials from mean RTs of the incongruent trials. Higher scores indicate relatively worse attentional control.

Bardeen et al. (2015) found that attentional control, as measured by the executive attention score on the ANT, moderated the relationship between difficulties implementing effective emotional regulation strategies and distress tolerance. Specifically, difficulties implementing effective emotion regulation strategies were inversely related to distress tolerance, but only among individuals with relatively lower attentional control. Thus, the authors concluded that attentional control may aid in difficulties with distress tolerance. Additionally, the authors asserted that interventions that target attentional control (e.g., mindfulness) may be helpful in mitigating psychopathology among individuals with less access to effective emotion regulation strategies.

Emotional regulation is considered an important factor in relation to psychological well-being and functioning. More specifically, emotional regulation may be defined as "all the extrinsic and intrinsic processes responsible for monitoring, evaluating and modifying emotional reactions, especially their intensive and temporal features, to accomplish one's goals" (Thompson, 1994, p. 27). As related to distress tolerance, emotional regulation involves adaptive means of responding to emotional distress through awareness, understanding, and acceptance of emotions, exercising control over impulsive behaviors, and engaging in goal-directed behaviors.

Emotion regulation is a process whereby an individual flexibly implements strategies to modulate the intensity and duration of emotional responses to meet individual goals and situational demands, while tolerating negative emotions in the pursuit of desired goals. Thus, individuals are able to persevere in spite of negative emotions (Gratz, Weiss, & Tull, 2015). Research indicates that emotional regulation is a mechanism of change in various interventions, such as DBT (Lynch, Chapman, Rosenthal, Kuo, & Linehan, 2006) and Acceptance-Based Behavioral Therapy (ABBT) for anxiety disorders (Roemer, Orsillo, & Salters-Pedneault, 2008).

Individuals who do not effectively manage emotional responses to stressful life events typically experience more distress and impairment (Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008). At the core of psychopathology is distress. For example, the symptomatology of both anxiety and depression involves emotional components. One common feature of depression and anxiety is difficulties with emotional regulation. There are individual differences in adaptive and maladaptive coping mechanisms and utilizing adaptive coping strategies aids in regulating emotions. Mindfulness entails a suite of coping strategies that is gaining traction in both literature and practice.

Mindfulness

Mindfulness may be conceptualized as (a) a state that may be induced through mindfulness practice, (b) a trait that differs between individuals, (c) and a skill or set of skills taught through training and practice (Brown & Ryan, 2003). Mindfulness, as a form of contemplative practice, is cultivated over time and has existed for centuries in both Eastern (e.g., Buddhism and Hinduism) and Western (e.g., Christian) philosophical and spiritual practices. In the Buddhist tradition, mindfulness is associated with meditation, a long-term and perhaps lifetime practice. In some Western traditions, mindfulness is associated with other contemplative

practices. For example, centering prayer, a form of Christian meditation rooted in Catholic mysticism (Knabb, 2012), is a form of mindfulness. The Buddhist tradition of mindfulness was translated into practice by Kabat-Zinn (1982, 2003), whose Mindfulness-Based Cognitive Therapy (MBCT) ushered the concept of mindfulness into the mainstream. Though the concept of mindfulness has origins in cultural, contemplative, and philosophical traditions, mindfulness practice does not need to adhere to any specific philosophical or religious orientation (Chiesa & Serretti, 2010; Kabat-Zinn et al., 2003). Longer-term mindfulness practices and short-term in-session exercises are incorporated into various form of therapies, such as MBCT (Kabat-Zinn, 2003), ACT (Hayes, 2004), and DBT (Linehan & Wilks, 2015).

Measurement of Mindfulness

The concept of mindfulness is challenging to encapsulate and measure because the (a) conception of mindfulness that has reached mainstream applications emerged from philosophical and spiritual contemplative practices, and (b) it is an internal state that is difficult to observe and describe. Thus, concrete definitions may not fully capture ancient concepts applied in modern times. Regardless, operational definitions exist. Kabat-Zinn (2003) defined mindfulness as "the awareness that emerges through paying attention, on purpose, in the present moment, and non-judgmentally to the unfolding of experience moment by moment" (p. 145). Mindfulness involves an open and expansive awareness of experience, cognitions, and emotions (Brown & Ryan, 2003). Mindfulness is described as "inherently a state of consciousness which involves consciously attending to one's moment-to-moment experience" (Shapiro, Carlson, Astin, & Freedman, 2006, p. 374) of the present situation in an open and nonjudgmental manner (Brown & Ryan, 2003). In summation, mindfulness is experiential and consists of purposeful attention with a present moment focus and a nonjudgmental stance.

More succinctly, some researchers (Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006) have suggested that mindfulness encompasses both awareness and acceptance (i.e., observing and describing but not judging and reacting to present experience). Although humans appear to be fully capable of engaging in mindfulness, the practice sometimes necessitates effort since it requires individuals to override the immediate and automatic tendencies to judge one's internal experience and external situation in a reactive manner based on existing "standards" (Carver & Scheier, 1982; Eisenberg, Smith, & Spinrad, 2011). Self-control occurs when individuals attempt to change how they would otherwise think, feel, or behave; it also entrails overriding or inhibiting competing impulses (Muraven & Baumeister, 2000). Mindfulness enables acceptance of an individual's present state, even when it is aversive (Verplanken & Fisher, 2014).

Park, Reilly-Spong, and Gross (2013) identified four problems in measuring mindfulness. First, there is no single agreed-upon definition of mindfulness. Second, among the self-report measures of mindfulness, there was no confirmation by test developers that respondents understood the items as truly representing "mindfulness." Third, because it is an internal experience, there have been no investigations of potential discrepancies between self-reports and external information, such as mindfulness that was either experimentally tested or observed by others. Finally, inflation of mindfulness effects may occur if subjects learn the terminology of mindfulness or simply value the idea of mindfulness rather than due to *actual* increases in mindfulness (Grossman, 2011). Park et al. (2013) indicated that most of these concerns are due to a lack of content validation. Recent authors have also voiced concerns about construct validation (van Dam et al., 2018).

The assumption underlying many of the existing measures is that mindfulness is a trait, or an individual difference. However, Lau et al. (2006) asserted, based on the two-factor model of

mindfulness introduced by Bishop et al. (2004), that a state of mindfulness may also be induced in the short-term. Thus, state-like measures were developed to capture short-term mindfulness elicited by mindfulness interventions, in which attention to experience is intentionally cultivated with an open, nonjudgmental orientation to experience. One prevalent measure of state mindfulness is the Toronto Mindfulness Scale (TMS; Lau et al., 2006). This instrument assesses participants' subjective experiences with mindfulness interventions to assess state mindfulness. The TMS was tested both in a sample of 158 subjects with no meditation experience and in a sample of 232 individuals who had at least 8 weeks of daily meditation practice. After the participants were instructed to pay attention to their breathing for 15 minutes, they completed the TMS. Results indicated internal consistency and suggested that two factors, curiosity and decentering, were the key facets of mindfulness.

Though there are concerns with such measures of mindfulness, thousands of studies have explored the topic. Mindfulness has been applied in many clinical interventions and proven effective in treating various disorders (Creswell, 2017), such as anxiety, eating disorders, and chronic pain in evidence-based treatments and therapy approaches, as discussed in the upcoming section on the impact of mindfulness. Common to the various acceptance and mindfulness approaches in therapy (Levin, Luoma, & Haeger, 2015) is the use of experiential exercises (i.e., brief mindfulness in therapeutic interactions involves efforts to change the function of one's internal experiences, in terms of how one relates to thoughts and feelings). These experiential exercises are intended to assist individuals in achieving a self-compassionate and decentered awareness of their internal experiences without allowing those experiences to exert undue influence over their behavior but rather to enhance the process of change (Hayes, Villatte, Levin, & Hildebrandt, 2011).

Models of Mindfulness

There is no clear agreement regarding how to conceptualize the construct of mindfulness nor the mechanisms behind mindfulness techniques. Two of the models of mindfulness described here include both a two- and three-component model. The two-component model of mindfulness encompasses (1) self-regulation of attention and (2) acceptance of experience (Bishop et al., 2004). Self-regulation of attention refers to the ability to keep one's awareness focused on present moment experiences. To self-regulate in this manner involves shifting attention and inhibiting secondary processing of thoughts, feelings, and sensations, which may involve executive functioning, specifically attentional control, as previously described. Orientation to experience refers to both curiosity about and acceptance of one's own experience. This means perceiving one's thoughts and feelings as temporary occurrences rather than as a reflection of one's self or reality. This manner of orienting to one's experience allows individuals to disengage from negative thoughts and feelings. This approach is in stark contrast to the avoidance of negative private experiences. Moreover, acceptance of these internal experiences allows individuals to buffer the impact of and reaction to such thoughts and feelings.

In the three-component model of mindfulness, Shapiro et al. (2006) suggested that three mechanisms are at work, including: (1) intention, (2) attention, and (3) attitude. These components represent a cyclical process that prompts a shift in perspective that is thought to be the overarching mechanism of action, called reperceiving. This higher-order concept represents a continual process of more objectively observing internal experiences. Mindfulness practice facilitates the cyclical process.

In the current study, I adopt the two-component model of mindfulness posited by Bishop et al. (2004), as this model was derived through a series of discussions among interdisciplinary

researchers who reached a consensus regarding the two key components of attention and acceptance (Park et al., 2013). The attention component refers to maintaining awareness of present moment experiences, while the acceptance component refers to the individual's relationship to their experience through an attitude of openness and curiosity. Furthermore, the two-component model of mindfulness has been well-cited, and those two components are common elements found in the various operational definitions and self-report measures of mindfulness (Coffey, Hartman, & Fredrickson, 2010; Park et. al., 2013).

In summary, although operational definitions are not in agreement—in general conceptual terms—mindfulness is often characterized by two key features, as discussed in the two-factor model of mindfulness. The first feature, self-regulation of attention, refers to a receptive attention to the present moment and an awareness of the transient nature of thoughts and emotions, a form of metacognition. This feature of mindfulness is distinct from, for example, merely being alert or attending to specific stimuli. The second key feature, acceptance of experience, is an attitudinal one, a compilation of openness, curiosity, and a nonjudgmental attitude towards whatever arises in the stream of consciousness (e.g. Baer, 2003; Bishop et al., 2004; Brown et al., 2007; Shapiro et al., 2006; Verplanken & Fisher, 2014). Taken together, these two features constitute mindfulness in the current study.

Impacts of Mindfulness Interventions

The literature differentiates between meditation practice, longer-term trainings, and short-term interventions (i.e., brief mindfulness). Among the longer-term trainings, Mindfulness Based Stress Reduction (MBSR) is well known and evidence-based (Kabat-Zinn, 1982; 2003). MBSR is typically offered in 8-week programs to enhance well-being. Numerous studies have utilized mindfulness to target particular areas of distress (e.g. anxiety). Developed at the University of

Massachusetts Medical Center, MBSR draws from both cognitive therapy and mindfulness practices derived from Buddhist teachings (Knabb, 2012). MBCT helps individuals to distance their conceptualization of "self" from unhelpful thoughts that accompany negative affect as a preventative approach against depressive symptoms.

Recent meta-analyses estimated small- to medium-sized treatment effects for the impact of mindfulness training on symptoms of stress, anxiety, and depression (Chiesa & Serretti, 2009; Hofmann, Sawyer, Witt, & Oh, 2010). Mindfulness training is an integral part of modified cognitive and behavioral therapies such as MBSR (Kabat-Zinn, 2003), MBCT (Chiesa & Seretti, 2010; Gu, Strauss, Bond, & Cavanagh, 2015; Segal et al., 2012), DBT (Linehan & Wilks, 2015), and ACT (Hayes et al., 1999; Hayes & Wilson, 2003). Additionally, mindfulness training has demonstrated potential as an intervention in the treatment of a number of concerns (Baer, 2003; Creswell, 2017; Hedman-Lagerlöf, Hedman-Lagerlöf, & Öst, 2018) including: chronic pain (Hilton et al., 2017), stress (Regehr, Glancy & Pitts, 2012), anxiety (Vøllestad, Nielsen, & Nielsen, 2012), relapses of depression (Williams et al., 2014), and disordered eating (Barney, Murray, Manasse, Dochat, & Juarascio, 2019).

Mindfulness is believed to reduce emotional reactivity (Uusberg, Uusberg, Talpsep, & Paaver, 2016). Individuals higher in trait mindfulness have exhibited reduced negative affect after stressors (Arch & Craske, 2010). This is consistent with studies that have revealed less threat-related neural activation among individuals higher in trait mindfulness who viewed faces expressing negative emotions, such as fear and anger (Creswell, Way, Eisenberger, & Lieberman, 2007). Mindfulness is also associated with emotional valence, which refers to the overall positivity or negativity of emotions (Good et al., 2016). A meta-analysis showed that mindfulness trainings may result in a less negative and more positive emotional tone (Sedlmeier

et al., 2012). Moreover, the ability to regulate one's emotional states is associated with more positive affect, lower levels of depression (DeRaedt et al., 2012), and diminished anxiety (Brunyé et al., 2013; Khoury, Sharma, Rush, & Fournier, 2015).

The effects of long-term mindfulness practice may be most reliably determined by comparing long-term meditators (e.g., those described as "lifestyle" meditators who practice daily or weekly practice through extended portions of a life span) with those who are new to mindfulness. However, there has been a surge of relatively "long-term" (8-weeks or more) mindfulness interventions that also yield reliable and large effects (e.g., ranging from Hedges' $g = 0.62$ to $g = 0.80$; Baer, 2003; Khoury et al., 2015) in terms of reducing negative affectivity compared to control groups. Though mindfulness may be best cultivated as a lifestyle through long-term practice or at least longer-term training, researchers and practitioners have also explored the efficacy of briefer forms of mindfulness-influenced exercises in laboratory, clinical, and work settings (Good et al., 2016).

Bardeen et al. (2015) indicated that mindfulness training techniques have promoted increased attentional control and suggested that empirically-supported treatment approaches that contain attention-based components, and particularly mindfulness interventions, may benefit individuals with difficulties implementing effective emotion regulation strategies and low distress tolerance. Achieving a state of mindfulness is effortful because it requires an individual to change the way they think, feel, or behave, and this may involve overriding or inhibiting competing impulses such as judging oneself (Eisenberg et al., 2011; Geisler, Bechtoldt, Oberländer, & Schacht-Jablonowsky, 2018). Though mindfulness may consist of longer-term trainings, there is also evidence proving the benefits of much shorter interventions (i.e., brief mindfulness).

Brief Mindfulness

Brief mindfulness interventions have ranged from single-session laboratory inductions to short two-week trainings. In the extant literature, the definition of "brief" mindfulness ranges widely from only five minutes (Tan, Lo, & Macrae, 2014; Wells & Roussi, 2014) to one-week (Banks, Welhaf, & Srour, 2015) or two-week (Moore, Gruber, Derose, & Malinowski, 2012) interventions. Numerous studies have successfully utilized mindfulness exercises of less than one hour in length (Bonamo, Legerski, & Thomas, 2015; Hastings, Roth, & Britton, 2012, MacLean et al., 2010; Roberts-Wolfe, Sacchet) and have produced benefits in the areas of cognitive performance, memory, and mood. Broderick (2005) found that an eight-minute guided mindfulness exercise reduced negative affectivity, as measured by the PANAS immediately after the exercise, compared to two other conditions, including rumination. Participants were asked to contemplate statements such as "why you react the way you do," while those in a distraction condition were asked to think about things that were not related to the self, such as "a freshly painted door." In another study, Zeidan, Johnson, Gordon, and Goolkasian (2010) found that a three-day intervention (20 minutes of guided practice per day) reduced negative affectivity at post-treatment compared to sham meditation or no training.

A recent meta-analysis by Schumer, Lindsay, Creswell, and Davila (2018) of 65 randomized control trials analyzed the influence of brief mindfulness training programs on measures of negative affect, a dimension of subjective distress (Watson & Clark, 1984). The authors indicated that they selected negative affectivity because it is clinically relevant and is one of the most prevalent measurement outcomes found in the mindfulness training literature. Negative affect encompasses the experience of both negative emotions (e.g., fear, anxiety, disgust) and mood states, such as sadness related to depression (Schumer et al., 2018; Watson,

Clark, & Carey, 1988). Specifically, negative affectivity is operationalized as any emotional state that is aversive, negative, uncomfortable, or unpleasant, such as found in anxiety, worry, depression, fear, or anger (Carmody & Baer, 2009; Keng, Smoski, & Robins, 2011).

Overall, in the meta-analysis, they found a small positive effect of brief mindfulness interventions on the reduction of negative affectivity (Hedges' $g = .21$ [.12, .29], $p < .001$). Neither the length of the training in number of sessions nor the length of the induction in number of minutes moderated the overall effect of mindfulness on negative affectivity. Specifically, studies that employed multiple types of mindfulness exercises in a single intervention ($g = .26$) and directed forms of mindfulness exercises applied to a task ($g = .30$) produced larger effects compared to studies inducing mindfulness only through focused breathing ($g = .16$) or a body scan ($g = -.09$). The authors suggested that instructing mindfulness exercises beyond body scans and focused breathing might generate the greatest effects. However, this advice may be balanced with the notion that the most substantial effects of mindfulness are found among individuals who practice it as a lifestyle.

There is emerging research measuring the duration of the impact of brief mindfulness. Brief experimental mindfulness inductions have been developed and tested in the literature (e.g., Broderick, 2005; Creswell, 2017; Creswell, & Denson, 2015; Papies, Pronk, Keesman, & Barsalou, 2015; Schofield, Creswell, & Denson, 2015; Westbrook et al., 2013). These induction approaches offer immense experimental control but produce relatively small and transient effects. Typically, effects are measured after exercises in laboratory settings, but effects are sometimes measured later the same day (e.g., via diary entries) or in a return visit to a lab. In the meta-analysis, the timing of outcome assessments measuring the dependent variables after brief mindfulness exercises did not significantly moderate the overall effect. However, effect sizes

tended to decrease over time, suggesting that the duration of brief mindfulness is fleeting. Those researchers cited in the meta-analysis (Schumer et al., 2018) who examined outcomes assessed immediately after the mindfulness intervention uncovered the largest effect (g = .29), followed by those assessed later that day (g = .18). When outcomes were assessed one day or longer after the mindfulness intervention, there were very small effects (g = .08), implying that the effects of brief mindfulness training on negative affectivity fade with time. Finally, whether researchers assessed state or trait negative affectivity did not significantly moderate the impact of the overall brief mindfulness training. However, state measures (g = .23) resulted in stronger training effects than trait measures (g = .14).

In the subsample of 46 RCTs from the larger meta-analysis (Schumer et al., 2018) that used a distress paradigm to measure negative affect reactivity, there was a small significant effect of brief mindfulness training (Hedges' g = .27 [.14, .35], $p < .001$). This was larger than the effect observed in studies that did not use a distress paradigm with variability in effect sizes (Hedges' g = .10 [-.01, .22], p = .08). Studies in which distress was induced before (g =. 26), after (g = .26), and both before and after mindfulness induction (g = .29) yielded similar negative reactivity effects, while studies that induced distress during brief mindfulness interventions produced a smaller effect (g = .15).

Overall, brief mindfulness interventions may be effective for reducing negative affectivity by activating attention regulation (Ainsworth, Eddershaw, Meron, Baldwin, & Garner, 2013; Dickenson, Berkman, Arch, & Lieberman, 2013), improving emotion regulation skills, and decreasing mind-wandering and rumination (Chiesa & Serretti, 2009; Rahl, Lindsay, Pacilio, Brown, & Creswell, 2017). Furthermore, brief mindfulness may be effective by increasing one's tolerance for negative emotional content and arousal (Lutz et al., 2014).

There is evidence that brief mindfulness-based interventions may positively impact health and psychological outcomes, even after only one session and with interventions as brief as five minutes (Howarth, Smith, Perkins-Porras & Ussher, 2019). However, there are mixed findings regarding the impact of mindfulness. Overall, across studies, there is support for brief mindfulness-based interventions demonstrating beneficial impacts on a range of negative emotions such as anger, sadness, and maladaptive distress responses (Howarth et al., 2019).

Paz et al. (2017) revealed that a brief mindfulness intervention (7 minutes) diminished participants' subjective experiences of anxiety in response to and in recovery from an anxiety-provoking laboratory stressor involving a hyperventilation induction. The buffering effect was worth noting, since the participants were smokers undergoing smoking deprivation during the laboratory experiment. Though they experienced less subjective distress given mindfulness before the stressor, the brief mindfulness did not buffer the participants against physiological anxious arousal (Skin Conductance Levels; SCL) nor emotional dysregulation (Respiratory Sinus Arrhythmia; RSA).

In laboratory settings, there is extant literature regarding the effectiveness of brief mindfulness in the context of distress. Three studies used a cold pressor task (Liu, Wang, Chang, Chen, & Si, 2013; Sharpe, Nicholson Perry, Rogers, Refshauge, & Nicholas, 2013; Swain & Trevena, 2014), while two employed a stress task (Cruess et al., 2015; Feldman et al., 2010). As with the treatment literature, there are mixed findings regarding the effectiveness of brief mindfulness, but the majority of studies demonstrate positive impacts of mindfulness related to various psychological outcomes.

Mindfulness Intervention and Decentering

Decentering, a mechanism of mindfulness which exerts therapeutic influence, is the realization that thoughts, feelings, and reactions are transitory patterns of mental activity (Lebois et al., 2015). Another term that describes this process is dereification (Lutz, Jha, Dunne, & Saron, 2015). For example, an individual may utilize a cognitive reappraisal to realize that "this is just a thought." Furthermore, in mindfulness practice, an ability to perceive thoughts in this manner is cultivated to cope with distracting thoughts or feelings and continue to focus on a target (e.g., the breath). Thus, decentering is a means to enable focus on the target object, and novices often use this form of reappraisal to disengage from distracting thoughts and feelings. Decentering is an outcome of shifting one's perspective through mindfulness interventions. Utilizing this decentering strategy, individuals become aware that thoughts, feelings, and reactions occur on a moment-by-moment basis but are not necessarily "true" representations of their identity (i.e., the self) and actual events (i.e., reality) in the present moment (Bishop et al., 2004; Brown et al., 2007). Aside from terms such as dereification and decentering, various researchers and clinicians use related terminology to describe similar metacognitive processes including "reperceiving" (Shapiro et al., 2006), "cognitive defusion" and "self as context" (Hayes & Feldman, 2004), "distancing" (Beck, 2011, p. 290), "meta-cognitive awareness" (Berstein et al., 2015), and finally the "decentering" component of mindfulness (e.g., Bishop et al., 2004). Activating this perspective of decentering enables individuals to perceive their thoughts and reactions to events as simply passing in the moment, without becoming engaged in sustained cognitive or affective responses to them (Kross & Ayduk, 2008).

Bernstein et al. (2015) proposed a metacognitive process model of decentering. The authors suggested that these decentering-related constructs reflect a higher-order construct

consisting of three interrelated metacognitive processes, namely meta-awareness, disidentification from internal experience, and reduced reactivity to thought content. Meta-awareness involves awareness of subjective experience and awareness that present moment experience is process—an awareness of the processes occurring in consciousness. Disidentification from internal experience refers to experiencing one's internal states as separate from one's "self." This process disentangles internal states such as thoughts, emotions, and sensations as integral parts of the "self." An example of this is when an individual identifies with their experience as "I am afraid." When an individual disidentifies from fear, they may relate to that experience as simply "a feeling of fear." Finally, reduced reactivity to thought content reduces the impact on other mental processes (e.g., attention, emotion, and motivation). In terms of measuring the three metacognitive processes of decentering, the decentering subscale of the Toronto Mindfulness Scale (Lau et al., 2006) is believed to capture all three processes (Hadash, Lichtash, & Bernstein, 2017).

The Current Study

Due to the effectiveness of mindfulness intervention both before and after distressing circumstances and the evidence that executing multiple brief mindfulness interventions in a single session yielded stronger effects (Schumer et al., 2018), in the current study, mindfulness is utilized as both as a prevention strategy (i.e., protective factor) and an intervention strategy (i.e., recovery after distress). In the smoking deprivation study (Paz et al., 2017), during the "recovery" period, participants were asked to recall and practice the mindfulness they had learned earlier; another approach that may elicit a stronger effect involves introducing a second direct brief intervention of mindfulness after a distressing task. The primary aim of the present

study was to examine whether a brief mindfulness induction would diminish subjective distress and negative affect both before and after a distressing task *and* the cumulative impact.

The current study employed three treatment groups and a control group to test the comparative effectiveness of three approaches to brief mindfulness (i.e., treatment conditions) involving a distressing task. The aim was to test the influence of brief mindfulness interventions both before and after a distressing task. Participants were randomly assigned to intervention or control groups and then randomly assigned to one of three intervention groups: (1) preventive mindfulness before the distress task; (2) recovery mindfulness after the distress task; or (3) preventive mindfulness before *and* recovery mindfulness after the distress task. At the inception of the current study, the following hypotheses were proposed:

Hypothesis 1. Preventive mindfulness will result in (a) higher state mindfulness, (b) less subjective distress, (c) lower negative affect, and (d) higher positive affect than a control group.

Hypothesis 2. Recovery mindfulness will result in (a) higher state mindfulness, (b) less subjective distress, (c) lower negative affect and (d) higher positive affect than a control group.

Hypothesis 3. Preventive *and* recovery mindfulness will result in (a) higher state mindfulness, (b) less subjective distress, (c) lower negative affect, and (d) higher positive affect than a control group.

CHAPTER II

METHODOLOGY

Participants

Participants were recruited among undergraduates through the SONA system in the University of North Dakota (UND) psychology program. Participants recruited from psychology courses were offered extra credit by instructors in courses promoting the lab study to their students. Undergraduate students between the ages of 18 and 34 were included in the study.

A power analysis was conducted for the planned one-way ANOVA analyses using G*Power 3.1.9.2 to determine the number of participants needed for the desired power of .80 with four groups. To establish the assumptions to calculate power, a meta-analysis of 65 randomized control trials (see Schumer et al., 2018) was consulted. The authors reported a range of effect sizes ranging from mostly small to sometimes moderate effect sizes, with smaller effects demonstrated in non-clinical samples. To detect a moderate effect size of .25, a sample size of 180 was recommended, while for a smaller effect size of .17, the recommended sample size was 384. Smaller effect sizes were expected given the student sample. For the mixed design, for a moderate effect size of .25, the recommended sample size was 36, and for the smallest effect size of .10, the recommended sample size was 200.

Demographics. The final sample included in the analysis was comprised of 400 undergraduate students who ranged in age from 17 to 34 years old (*M* age = 19.57, SD = 1.87). From the 406 subjects enrolled in the study, six cases were eliminated due to excess missing data. The majority of the sample reported their biological sex as female (70.5%). Reported ethnic

identities were White (87.8%), Hispanic (0.8%), Black (2.3%), American Indian (1.3%), Asian (2.3%), and Other (0.3%). Of the sample, 5.6% reported a multi-ethnic identity. Participants reported their educational status as follows: freshmen (46.0%), sophomores (35.8%), juniors (12.3%), and seniors (5.8%).

Prior Experience and Attitudes towards Mindfulness. Overall, 87% of participants had prior experience with mindfulness, while 13% had no prior experience. Of those with prior experience, self-reported experience levels included "a great deal" (3.0%), "a lot" (11.5%), "a moderate amount" (41.8%), and "a little" (30.8%). Less than 20% of participants reported no experience with mindfulness and indicated that they had not engaged in any of the mindfulness activities listed. The most common mindfulness activity reported by participants was yoga (61.3%), followed by meditation (30.8%), mindfulness (16.8%), mindfulness-based therapies (4.3%), and Tai Chi (0.5%).

Participants were asked about their attitudes toward mindfulness and responded as follows: "somewhat positive" (49.8%), "extremely positive" (15.5%), "neither positive nor negative" (22.8%), and "somewhat negative" (0.5%). Finally, 11.3% had "no opinion" about mindfulness.

Measures

Demographics Questionnaire. The demographic questionnaire included items concerning age, biological sex, race, and ethnicity. Furthermore, they were asked about prior mindfulness training experiences and practice along with related activities such as yoga (Schimmelpfenning, 2018).

Acceptance and Action Questionnaire–II (AAQ-II). The AAQ-II (Bond et al., 2011) comprises seven items, each with a seven-point Likert-type scale. Higher scores indicate greater

levels of psychological flexibility and lower levels of experiential avoidance (Hayes, Luoma, Bond, Masuda, & Lillis, 2006). The AAQ-II has been demonstrated to have good construct validity (Bond et al., 2011). Internal consistency in the present study was $\alpha = .89$.

Symptoms of Inattention. The Barkley Adult ADHD Rating Scale-IV (BAARS-IV) is a rating scale used to assess attention deficit hyperactivity disorder (ADHD) symptoms (Barkley, 2011). In this study, it was used to assess symptoms of inattention. The inattention subscale assesses nine symptoms of inattention. Subjects responded to each item using a four-point scale, ranging from 1 = "sometimes" to 4 = "very often." An example item is, "I fail to give close attention to details or make careless mistakes in my work." In a nationally representative sample of adults, the scales demonstrated both satisfactory internal consistency and test-retest reliability over a two- to three-week period (Barkley, 2011). Internal consistency in the present study was inattention $\alpha = .80$.

Difficulties in Emotion Regulation Scale (DERS). The DERS is a 36-item questionnaire that assesses common problems with emotion regulation in six domains: nonacceptance/avoidance of emotions, difficulties engaging in goal-directed behavior when experiencing negative emotions, difficulties with impulse control, lack of awareness of emotional states, limited access to emotion regulation strategies, lack of clarity about discrete emotional states (Gratz & Roemer, 2004). Items are rated on a five-point scale (1 = "almost never" to 5 = "almost always"). Higher scores reflect greater difficulty regulating emotions. The DERS has good internal consistency, construct, and predictive validity (Gratz & Roemer, 2004). The internal consistency of the overall scale in the current study was $\alpha = .78$.

Distress Tolerance Scale (DTS). The DTS (Simons & Gaher, 2005) is a 15-item measure that assesses the degree to which participants believe they can withstand the distress

associated with negative emotional states. Specifically, the DTS is comprised of items which assess the following: one's perceived ability to tolerate negative emotions, the perception of negative emotions as distressing, difficulty concentrating when experiencing emotional distress, and the degree of effort one expends to alleviate emotional distress. DTS items are rated on a five-point scale (1 = "strongly agree" to 5 = "strongly disagree") based on the degree to which the participant agrees with each statement. Higher scores typically indicate greater tolerance of negative emotions; however, for the purpose of the present study, the scale was scored so that higher scores indicated emotional distress intolerance. The DTS has demonstrated adequate psychometric properties, including convergent and discriminant validity, internal consistency, and retest reliability over a six-month period (Simons & Gaher, 2005). Internal consistency of the overall scale in the current study was $\alpha = .87$.

Five Facet Mindfulness Questionnaire (FFMQ). The FFMQ is a 39-item self-report measure consisting of statements regarding facets of mindfulness (e.g., "When I have distressing thoughts or images, I am able just to notice them without reacting."). Items on the FFMQ (Baer et al., 2006) are rated on a scale of 1 = "never or very rarely true" to 5 = "always true." Baer et al. (2006) combined items from five different mindfulness self-report questionnaires to develop the FFMQ. Specifically, the FFMQ was derived using factor analyses of the combined pool of items from five mindfulness questionnaires, including the following: the Cognitive and Affective Mindfulness Scale (CAMS; Feldman, Hayes, Kumar, & Greeson, 2004), the Freiburg Mindfulness Inventory (FMI; Buchheld, Grossmann, & Walach, 2001), the Kentucky Inventory of Mindfulness Skills (KIMS; Baer, Smith, & Allen, 2004, the Mindful Attention an Awareness Scale (MAAS; Brown & Ryan, 2003), and the Mindfulness Questionnaire (MQ; Chadwick, Hember, Mead, Lilley, & Dagnan, 2005). After designing the FFMQ using factor analyses of

existing measures of mindfulness (Baer et al., 2006), construct validity was later demonstrated in meditating and nonmeditating samples (Baer et al., 2008). All of the subscales loaded significantly on the higher-order factor of mindfulness and the instrument demonstrated incremental and discriminant validity (Baer et al., 2006). The factor analysis of the responses to the five questionnaires resulted in a five-factor structure of mindfulness with the following factors: nonreactivity ($\alpha = 0.75$), observing ($\alpha = 0.83$), acting with awareness ($\alpha = 0.87$), describing ($\alpha = 0.91$), and nonjudging ($\alpha = 0.87$). Researchers also examined the subscales or facets of mindfulness and found that three of them, namely, acting with awareness, nonjudging, and nonreactivity, significantly predicted improvements in psychological outcomes (Chiesa, 2013). In the current study, the internal consistency of the overall FFMQ measure was $\alpha = 0.82$.

Paced Auditory Serial Addition Task (PASAT). The PASAT (Gronwall, 1977) is a measure of cognitive functioning that is used to assess auditory information processing speed and flexibility. In addition, it taps into mathematical calculation ability. The PASAT is administered from a standardized audio recording, and during the task, participants hear single-digit numbers. They are instructed to sum the most recent number with the previous number. After providing each sum, the participant must ignore the sum and add the following number to the most recently presented number. Participants are first given instructions with an example as follows: “If the first two numbers were ‘5’ and ‘7,’ you would say ‘12.’ If the next number were ‘3,’ you would say ‘10.’ Then if the next number were ‘2,’ you would say ‘5’ and so on.” There is then a brief practice trial wherein single digits are presented every 3 seconds. After the practice, there are two trials. During the first trial, participants are presented with digits every 3 seconds. In the second trial, the interstimulus interval is reduced to 2 seconds, increasing the difficulty level. The total number of correct sums (out of 60 possible) in each trial is summated

to compute a test score. The PASAT requires approximately 8 minutes to complete. This challenging task, typically delivered in an auditory format, is also used to assess attentional processing, immediate memory, and attention (Tombaugh, 2006).

In addition to utility as a neuropsychological test, both the PASAT and a computerized version called the PASAT-C have been used in numerous studies to reliably induce a stress response (e.g., Arens, Zeier, Schwieren, Huisgen, & Barnow, 2018; Mathias, Stanford, & Houston, 2004; Yiu, Christensen, Arlt, & Chen, 2018). As a method of distress induction, the PASAT has induced self-reported anxiety, anger, frustration, and difficulty concentrating (Brown et. al, 2002; Lejuez, Kahler, & Brown, 2003). In the current study, the PASAT-C was utilized for the purpose of inducing distress, since this was an effective means of stress induction in the aforementioned studies (Arens et al., 2018; Mathias et al., 2004; Yiu, et al., 2018).

In previous research, there were challenges with inducing state mindfulness among undergraduate students (Schimmelpfenning, 2018). Some researchers have hypothesized that nonclinical samples are generally likely to show less significant mindfulness training effects due to floor effects (Schumer et al., 2018). Specifically, in nonclinical samples where participants exhibit fewer clinical symptoms (e.g., depression and anxiety) at baseline, there is less potential for improvement in negative affectivity compared to clinical samples (Carmody & Baer, 2009; Spijkerman, Pots, & Bohlmeijer, 2016). As a manipulation check to ensure that the PASAT-C does indeed induce distress, individuals were asked to rate subjective distress on the SUDS.

Positive and Negative Affect Schedule (PANAS). The PANAS (Watson, Clark, & Tellegen, 1988) has 20 items in total with two subscales of 10 items each measuring Positive Affect (PA) and Negative Affect (NA), each with a 5-point scale. Construct validity has been

found to be good, and confirmatory factor analysis yielded two factors corresponding to the PA and NA scales (Crawford & Henry, 2004).

Toronto Mindfulness Scale (TMS) The TMS is a state measure of mindfulness which assesses changes in state mindfulness between groups (Lau et al., 2006). A self-report measure, the 13-item test assesses experiences of mindfulness rated on a five-point scale from 0 = "not at all" to 4 = "very much." The TMS measures the state of mindfulness immediately after a mindfulness exercise (Lau et al. 2006). The TMS consists of two factors: curiosity about (or interest in) inner experiences and decentering from experiences (awareness of them without being caught up in or carried away by them). From the curiosity subscale, an example item is as follows: "I was curious about each of the thoughts and feelings that I was having." From the decentering subscale, an example item is the following: "I was more concerned with being open to my experiences than controlling or changing them." The TMS has demonstrated internal reliability (α =.87) in previous research (Lau et al., 2006). In the current study, the reliability of TMS was α =.91 at Time 1 and α =.94 at Time 2. Because TMS is designed to be used after an intervention, it was only administered after the mindfulness interventions (Lancaster, Klein, & Knightly, 2016).

Subjective Units of Discomfort Scale (SUDS). The SUDS (Wolpe & Lang, 1964) is a single-item measure which gauges the participant's subjective level of distress. It is evaluated on a 100-point scale, where 0 = "Feeling completely calm with no anxiety" and 100 = "The most extreme anxiety you've ever felt."

Effort. Since mindfulness exercises may appear unusual to students lacking mindfulness experience (Feldman et al., 2010), and given that prior studies have found that students may lack motivation in studies of mindfulness (Schumer et al., 2018), the effort devoted to the study was

assessed ("To what extent did you put your full effort into the study?") on a scale of 1 to 10 at the end.

Mindfulness Interventions

Brief mindfulness exercises and trainings (e.g., downloadable mindfulness applications for phones and Internet-streamed audios) are widely available (Creswell, 2017; Wahbeh, Syalina, & Oken, 2014). The exercises for this study were in mp3 format, obtained from the University of California, Los Angeles (UCLA), specifically from the UCLA Mindful Awareness Research Center website and played through a laptop computer with external speakers. For the current study, 9-minute, 30-second, and 19-minute exercises were utilized. Following the completion of self-report measures, participants randomized to the mindfulness intervention conditions listened to recorded instructions (i.e., replicating procedures of Brunyé et al., 2013) asking them to maintain a straight upright sitting posture, hands resting on their lap, shoulders relaxed, head upright, and feet resting flat on the floor. If they were comfortable doing so, subjects were asked to close their eyes; if not, they were asked to direct their gaze slightly downward and forward without focusing on anything in particular.

Mindfulness I (Prevention): Complete Meditation. In MBSR, there is a progression from breathing to a body scan and various seated meditation practices. A mindful breathing exercise has been shown to increase decentering (Feldman et al., 2010), which may be an effective method to disengage from thoughts and actions (Keng et al., 2011). Additionally, a concentrative practice with focused attention, such as focus on the breath, has been suggested as an easier approach to mindfulness and as an early-stage practice for novices (Chiesa, Calati, & Serretti, 2011). To introduce the elements of MBSR in a brief format, a 19-minute meditation was selected to represent a compilation of the MBSR mindfulness techniques in a single brief

session. The mindfulness meditation, downloaded from UCLA Health (https://www.uclahealth.org/marc/mpeg/03_Complete_Meditation_Instructions.mp3) is an audio recording of a female voice leading the exercise in mp3 format. Following the typical sequence of MBSR training programs, subjects were initially guided through a breathing meditation. They were then guided to gain awareness of sensations in their body, notice any emotions, and return to noticing their breathing in the present moment.

A full transcript of the intervention is accessible through this link and the text included in Appendix A:

https://www.uclahealth.org/marc/workfiles/CompleteMeditation_Transcript.pdf

Mindfulness II (Recovery): Loving-Kindness. Loving-kindness is typically introduced later in mindfulness practice. This mindfulness exercise was also downloaded from UCLA's Health Mindfulness Awareness Research Center, and a 9-minute, 30-second session was chosen for the mindfulness intervention after distress (https://www.uclahealth.org/marc/mpeg/05_Loving_Kindness_Meditation.mp3). This mindfulness exercise was recorded by the same female voice as in the first mindfulness condition. The facilitator guided the subjects through considering the loving-kindness they might receive from an existing known relationship of their choosing (e.g., relative, close friend). They were then guided to imagine returning the loving-kindness to the person they chose. Finally, subjects were guided through self-compassion (i.e., giving loving-kindness to themselves).

A full transcript of the intervention is also provided, following this link, and listed in Appendix B:

https://www.uclahealth.org/marc/workfiles/LovingKindnessMeditation_Transcript.pdf

Both mindfulness interventions were recorded by the same female voice at the UCLA Mindful Awareness Research Center.

For the control condition, participants listened to history recordings for the same time intervals as the mindfulness interventions. The recordings were taken from Chapters 44 (19 minutes) and Chapter 45 (9 minutes) of the open-access book, "Memoirs of the Court of Queen Elizabeth" (Aikin, 1818). The audio recording is of a woman reading the history. Her voice was highly similar in tone, pitch, and tempo relative to the voice in the mindfulness recordings.

Procedures

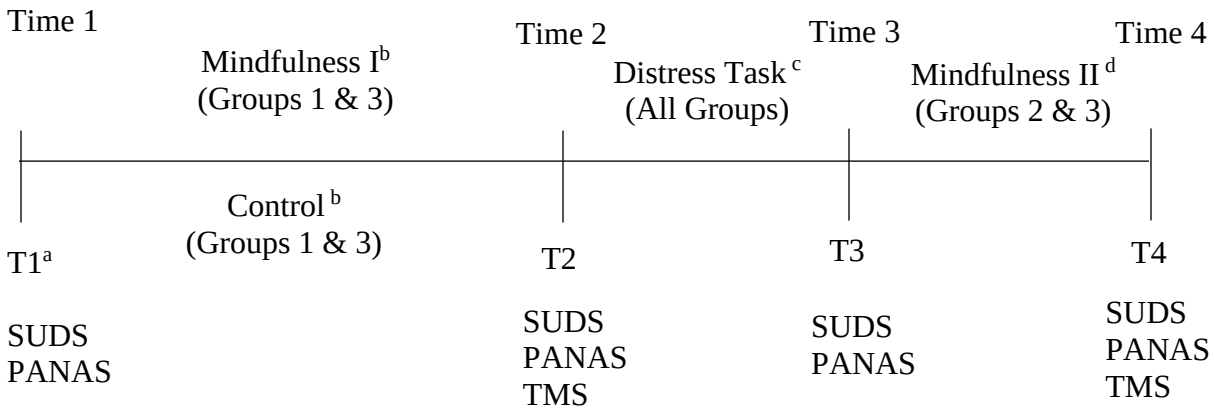
Data were collected with individual participants in a research setting at the University of North Dakota (UND). The consent forms were completed by participants and all testing procedures were administered by undergraduate and graduate research assistants who received human subjects research educational training authorized by the UND Institutional Review Board. Participants were randomly assigned to one of four groups: (a) prevention mindfulness, (b) recovery mindfulness, (c) prevention and recovery mindfulness, or a (d) control group. A summary of study interventions by group can be found in Table 1.

Table 1. Study Protocol by Group

	Mindfulness I	Distress Task	Mindfulness II
Group 1	X	X	X
Group 2		X	X
Group 3	X	X	X
Group 4		X	

After completing the consent procedure, all participants completed the demographic questions, mindfulness and meditation experience questions, and the baseline self-report measures. The flow of the experimental procedure is illustrated in Figure 1. In addition, Figure 1 presents the data collected at baseline, Time 1 (T1) and immediately after each intervention Time 2 (T2), Time 3 (T3), and Time 4 (T4). After the first mindfulness exercise or control audio recording (T2), the following dependent variables were assessed: state mindfulness (T2 Decentering, T2 Curiosity), affect (T2 Positive and Negative Affect), and subjective units of distress (T2 SUDS). After completing the distress task (T3), affect (T3 Positive and Negative Affect) and subjective units of distress (T3 SUDS) were collected. Finally, after the second mindfulness or control audio recording (T4), the following dependent variables were assessed: state mindfulness (T4 Decentering, T4 Curiosity), affect (T4 Positive and Negative Affect), and subjective units of distress (T4 SUDS).

Figure 1: Flow of Experimental Procedure



Note: [a] Additional baseline measures collected (see Table 2; Results).
SUDS = Subjective Units of Distress, PANAS = Positive and Negative Affect Scale; TMS= Toronto Mindfulness Scale
Time intervals: [b] 19 minutes, [c] Time 2: 8 minutes, [d] Time 3: 9 minutes

CHAPTER III

RESULTS

Preliminary Analyses

Preliminary data analyses were conducted to ensure that the data fulfilled assumptions required for the main analyses**.** Analyses were conducted using the Statistical Package for the Social Sciences (IBM SPSS version 25).

Data accuracy and outliers. All participant data were collected in the same laboratory space on a desktop computer using Qualtrics software. Most questions had pre-set values requiring respondents to click on an option provided to them. However, some open-ended responses (e.g., self-reported GPA) were also collected. The analysis revealed that no outliers were found on any of the measures.

Missing values. A common approach for dealing with missing data is mean substitution based on a single imputation, which involves replacing the missing values with the mean value of the observed values (Tabachnick & Fidell, 2007), and this was the approach adopted in the current study. A drawback of this approach is that mean substitution may reduce the variability of a variable (Allison, 2002). However, according to guidelines proposed by Tabachnick and Fidell (2007), mean substitution may be utilized when missing data accounts for less than 5% of the data collected. In the current study, less than 2% of the data were missing; thus, mean substitution was used.

Normality. Considering the sample size in the current study, it was expected that the sampling distributions of the means of the variables would be normally distributed (Tabachnick

& Fidell, 2007). The Central Limit Theorem indicates that with sufficiently large sample sizes, sampling distributions of means are normally distributed regardless of the distributions of variables (Tabachnick & Fidell, 2007). In the current study, the sample size is sufficiently large, with n = 400 and approximately n =100 ($\pm$ n = 4 per randomly assigned group). Thus, the *F* test was expected to be robust with regards to any violation of normality (Tabachnick & Fidell, 2007).

Main Analyses

Statistical equivalence at baseline. Statistical equivalency between the groups was tested using group comparisons of baseline data in the following section. The four groups were compared based on their scores on the baseline measures, including difficulties in emotion regulation, trait mindfulness, experiential avoidance, symptoms of inattention, and distress tolerance to determine whether the groups were equivalent. They were then compared based on demographics and self-reported experience with mindfulness and meditation activities for group equivalency.

Group comparisons using one-way ANOVA and Dunnett's test were completed to evaluate group equivalence at baseline. Dunnett's test was selected, as it is recommended when comparing treatments with a single control (Tabachnick & Fidell, 2007). The analysis revealed no statistically significant differences between the four groups for the following variables: hours of sleep ($F(3,313) = 0.969$, $p = .411$), caffeine consumption ($F(3,396) = 1.843$, $p = .139$), symptoms of inattention ($F(3,397) = 0.360$, $p = .782$), experience with mindfulness ($F(3,394) = 0.386$, $p = .763$), attitudes towards mindfulness, ($F(3,395) = 0.762$, $p = .516$), trait mindfulness (as measured on the FFMQ; $F(3,397) = 1.693$, $p = .168$), subjective distress (as measured on SUDS; $F(3,313) = 0.633$, $p = .594$), positive affect ($F(3,399) = 1.035$, $p = .377$), and negative

affect ($F(3,395) = 2.617$, $p = .057$), as measured based on the PANAS. See Table 2 for the means and standard deviations of baseline variables.

Table 2. Means (and standard deviations) of baseline variables

	Group/Condition			
	Group 1[a]	Group 2[a]	Group 3[a]	Group 4[a]
Sleep	7.16 (1.37)	6.80 (1.41)	7.05 (1.31)	6.99 (1.32)
Caffeine	1.90 (1.31)	1.86 (1.16)	1.67 (1.21)	1.56 (0.96)
Experiential Avoidance	18.25 (6.36)	19.27 (7.93)	20.34 (9.65)	19.70 (7.41)
Difficulties with Emotion Regulation	91.56 (17.59)	96.26 (16.49)	93.49 (17.05)	96.31 (17.14)
Inattention	13.96 (3.27)	14.24 (4.08)	14.18 (4.36)	13.73 (3.56)
Distress Tolerance	3.58 (0.74)	3.39 (0.82)	3.49 (0.82)	3.43 (0.64)
Trait Mindfulness	128.81 (14.08)	124.92 (14.10)	127.30 (15.51)	129.03 (13.98)
Mindfulness Attitudes	3.50 (2.83)	2.98 (2.31)	3.29 (2.57)	3.09 (2.74)
Mindfulness	4.55 (1.64)	4.44 (1.45)	4.60 (1.58)	4.37 (2.02)
T1 SUDS	12.20 (14.57)	14.24 (18.14)	14.06 (21.14)	12.36 (18.43)
T1 Positive Affect	26.01 (6.92)	24.48 (6.32)	25.49 (5.99)	24.92 (6.69)
T1 Negative Affect	15.05 (4.04)	15.47 (5.44)	15.92 (4.73)	15.18 (3.79)

[a] Group 1: Pre-distress mindfulness; Group 2: Post-distress mindfulness
Group 3: Pre- and post-distress mindfulness; Group 4: Control

Group comparisons after first mindfulness intervention (T2). Group comparisons using one-way ANOVA and Dunnett's test were completed to evaluate the impact of the 19-

minute mindfulness intervention on subjective distress (SUDS), state mindfulness (TMS), and affect (PANAS).

State Mindfulness. Firstly, state mindfulness was measured by the TMS, which consists of two subscales. The assumption of homogeneity of variance was satisfied for both subscales of TMS using Levene's test. There were statistically significant differences between group means for TMS Decentering, $F(3,394) = 14.254$, $p < .001$, $\acute{\omega}^2 = .091$, and TMS Curiosity, $F(3,396) = 7.103$ $p < .001$, $\acute{\omega}^2 = .044$. Post-hoc comparisons using Dunnett's test indicated that the mean score for both conditions receiving the first dose of brief mindfulness, namely Group 1 and Group 3, were significantly higher relative to the control condition on T2 for TMS Decentering. Similarly, Group 1 and Group 3 were significantly higher than the control condition on T2 TMS Curiosity. Group 2, which was assigned the control condition (history podcast based on Aikin, 1818) rather than brief mindfulness, did not differ from the control group on either T2 TMS Decentering or T1 TMS Curiosity. Means and standard deviations are indicated in Table 3.

Table 3. Group Comparisons on T2 Decentering and Curiosity

Measure	Group/Condition				
	Group 1[a]	Group 2[a]	Group 3[a]	Group 4[a]	Post Hoc[b]
Post-Mindfulness I					
T2 Decentering	20.90 (5.09)	17.31 (5.23)	20.84 (4.60)	17.90 (5.16)	1 > 4, 3 > 4
T2 Curiosity	18.64 (4.88)	16.24 (5.52)	18.95 (5.34)	16.64 (4.90)	1 > 4, 3 > 4

Note. One-way ANOVA with post hoc tests.
[a] Group 1: Pre-distress mindfulness; Group 2: Post-distress mindfulness
Group 3: Pre- and post-distress mindfulness; Group 4: Control
[b] The numbers in the post hoc column refer to significant pair-wise group comparisons with Dunnett's procedure.

Affect. The assumption of homogeneity of variance was satisfied for both positive and negative affect using Levene's test at T2. There were significant differences in positive affect, $F(3,396) = 27.704$, $p < .001$, $\acute{\omega}^2 = .167$ at T2. Post hoc comparisons using Dunnett's test indicated that the mean scores for both conditions receiving the first brief mindfulness, namely Group 1 and Group 3, were significantly higher than the control condition on T2 Positive Affect. However, none of the treatment groups exhibited significant differences from the control group on T2 Negative Affect. Means and standard deviations are presented in Table 4.

Table 4. Group Comparisons on T2 Positive and Negative Affect

Measure	Group/Condition				
	Group 1[a]	Group 2[a]	Group 3[a]	Group 4[a]	Post Hoc[b]
Post-Mindfulness I					
T2 Positive Affect	25.39 (7.37)	18.51 (6.88)	24.01 (6.76)	18.44 (6.57)	1 > 4, 3 > 4
T2 Negative Affect	13.21 (2.58)	13.40 (3.73)	13.11 (2.34)	13.56 (3.55)	

Note. One-way ANOVA with post hoc tests.
[a] Group 1: Pre-distress mindfulness; Group 2: Post-distress mindfulness
Group 3: Pre- and post-distress mindfulness; Group 4: Control
[b] The numbers in the post hoc column refer to significant pair-wise group comparisons with Dunnett's procedure.

Subjective Distress. For subjective distress, Levene's test of homogeneity of variance was violated at T2, T3, and T4. Thus, for subjective distress, a moderately positively skewed variable (based on a single-item measure of 0 to 100), a log transformation was done. Importantly, the pattern of means and significance of findings between the untransformed and transformed variable converged; thus, the untransformed means are reported to enhance understanding of the practical significance of the findings.

The analysis revealed that there was a significant difference on SUDS, $F(3,395) = 4.947$, $p < .05$, $\acute{\omega}^2 = .029$. Post hoc comparisons using Dunnett's test were conducted, revealing that after the first mindfulness intervention, Group 1 and Group 3 scored lower on subjective distress than the control group. Group 2 was not significantly different from Group 4, as both of these groups received the control condition, the history podcast. Means and standard deviations are reported in Table 5.

Table 5. Group Comparisons of Mindfulness Conditions vs. Control Condition on T2 SUDS

Measure	Group/Condition				
	Group 1[a]	Group 2[a]	Group 3[a]	Group 4[a]	Post Hoc[b]
Post-Mindfulness I					
T2 SUDS	8.25 (15.42)	15.18 (19.17)	7.21 (13.29)	14.10 (18.79)	1 < 4, 3 < 4

Note. One-way ANOVA with post hoc tests.
[a] Group 1: Pre-distress mindfulness; Group 2: Post-distress mindfulness
Group 3: Pre- and post-distress mindfulness; Group 4: Control
[b] The numbers in the post hoc column refer to significant pair-wise group comparisons with Dunnett's procedure.

Group comparisons after distress task (T3)

Group comparisons using one-way ANOVA were completed to evaluate the impact of the 8-minute distress task on the dependent variables (T3 Positive Affect, T3 Negative Affect, T3 SUDS). All groups participated in the distress task, namely the PASAT. At T3, after the distress task, there were no significant differences between the groups with regards to any of the aforementioned dependent variables. The means and standard deviations for the treatment and control groups are indicated in Table 6. State mindfulness measures were collected only at T2 and T4 after each mindfulness (or control) condition; hence, those results are only provided at those time points.

Table 6. Group Comparisons of T3 Positive Affect, Negative Affect, and SUDS

Measure	Group/Condition			
	Group 1	Group 2	Group 3	Group 4
Post-Distress Task				
T3 Positive Affect	21.46 (7.46)	19.93 (6.74)	21.73 (7.06)	21.56 (7.62)
T3 Negative Affect	17.06 (4.51)	16.68 (5.01)	16.20 (4.11)	16.75 (5.17)
T3 SUDS	24.75 (23.66)	28.93 (28.01)	20.72 (21.66)	28.12 (24.79)

Note. One-way ANOVA
[a] Group 1: Pre-distress mindfulness; Group 2: Post-distress mindfulness
Group 3: Pre- and post-distress mindfulness; Group 4: Control

Group comparisons after second mindfulness intervention (T4)

The following section describes the effects of the conditions on state mindfulness, affect, and subjective distress after the second mindfulness or control condition. Group comparisons using one-way ANOVA and Dunnett's test were completed to evaluate the impact of the second 9-minute mindfulness intervention on state mindfulness, affect, and subjective distress relative to the control condition.

State Mindfulness. There were statistically significant differences between group means regarding state mindfulness, namely TMS Decentering, $F(3,396) = 6.946$, $p < .001$, $\acute{\omega}^2 = .043$ and TMS Curiosity, $F(3,396) = 11.871$, $p < .001$, $\acute{\omega}^2 = .075$. Post hoc comparisons using Dunnett's test indicated that Group 3 was significantly different from the control condition on T4 TMS Decentering. Similarly, Group 3 was significantly different from the control condition on T4 TMS Curiosity. Group 1 (which practiced brief mindfulness before but not after the distress task) and Group 2 (which practiced brief mindfulness only after the distress task) did not differ

from the control group on either T4 TMS Decentering or T4 TMS Curiosity. See Table 7 for means and standard deviations.

Table 7. Group Comparisons on T4 Decentering and Curiosity

Measure	Group/Condition				
	Group 1[a]	Group 2[a]	Group 3[a]	Group 4[a]	Post Hoc[b]
Post-Mindfulness II					
T4 Decentering	16.57 (5.54)	19.21 (6.56)	20.19 (5.60)	17.80 (6.50)	3 > 4
T4 Curiosity	13.79 (5.22)	17.28 (6.30)	18.36 (5.74)	15.72 (5.90)	3 > 4

Note. One-way ANOVA with post hoc tests.
[a] Group 1: Pre-distress mindfulness; Group 2: Post-distress mindfulness
Group 3: Pre- and post-distress mindfulness; Group 4: Control
[b] The numbers in the post hoc column refer to significant pair-wise group comparisons with Dunnett's procedure.

Affect. The group condition resulted in a significant difference in Positive Affect, $F(3,396) = 7.763$, $p < .001$, $\acute{\omega}^2 = .048$. Post hoc comparisons using Dunnett's test revealed that only Group 3, which practiced mindfulness before and after the distress task, differed from the control group, with higher positive affect than the control group on T4 Positive Affect. No significant differences across groups were observed in relation to T4 Negative Affect (see Table 8 for means).

Table 8. Group Comparisons T4 Positive and Negative Affect

Measure	Group/Condition				
	Group 1[a]	Group 2[a]	Group 3[a]	Group 4[a]	Post Hoc[b]
Post-Mindfulness II					
T4 Positive Affect	18.13 (7.15)	19.49 (7.61)	21.55 (6.91)	17.04 (6.23)	3 > 4
T4 Negative Affect	13.17 (2.94)	12.53 (2.45)	12.82 (2.04)	13.24 (3.41)	

Note. One-way ANOVA with post hoc tests.
[a] Group 1: Pre-distress mindfulness; Group 2: Post-distress mindfulness
Group 3: Pre- and post-distress mindfulness; Group 4: Control
[b] The numbers in the post hoc column refer to significant pair-wise group comparisons with Dunnett's procedure.

Subjective Distress. Finally, there was a significant difference regarding SUDS, $F(3,396) = 6.009$, $p < .01$, $\acute{\omega}^2 = .036$. Post hoc comparisons using Dunnett's test indicated that for measures of subjective distress, both groups that received brief mindfulness after the distress task exhibited significant differences from the control group. Specifically, the means of Group 2 and Group 3 were lower compared to the control condition on T3 SUDS, as shown in Table 9.

Table 9. Group Comparisons of T4 SUDS

Measure	Group/Condition				
	Group 1[a]	Group 2[a]	Group 3[a]	Group 4[a]	Post Hoc[b]
Post-Mindfulness II					
T4 SUDS	13.35 (17.55)	9.10 (15.40)	6.68 (12.63)	16.06 (21.92)	2 < 4, 3 < 4

Note. One-way ANOVA with post hoc tests.
[a] Group 1: Pre-distress mindfulness; Group 2: Post-distress mindfulness
Group 3: Pre- and post-distress mindfulness; Group 4: Control
[b] The numbers in the post hoc column refer to significant pair-wise group comparisons with Dunnett's procedure.

Post Hoc Comparison Summary. In summary, post hoc comparisons were assessed using Dunnett's test, wherein Group 4 was treated as a control, and the other groups were compared against it. This procedure was completed for each of the dependent variables collected at three different time points: (T2) after the initial 19-minute mindfulness or control audio recording, (T3) after the 8-minute PASAT task to induce stress, and (T4) after the second 9-minute mindfulness or control audio recording. Significant differences between groups, across all time points, are depicted in Table 10.

Table 10. Summary of Group Comparisons of all Mindfulness Conditions vs. the Control Condition

Measure	Group/Condition				
	Group 1[a]	Group 2[a]	Group 3[a]	Group 4[a]	Post Hoc[b]
Post-Mindfulness I					
T2 Decentering	20.90 (5.09)	17.31 (5.23)	20.84 (4.60)	17.90 (5.16)	1 > 4, 3 > 4
T2 Curiosity	18.64 (4.88)	16.24 (5.52)	18.95 (5.34)	16.64 (4.90)	1 > 4, 3 > 4
T2 Positive Affect	25.39 (7.37)	18.51 (6.88)	24.01 (6.76)	18.44 (6.57)	1 > 4, 3 > 4
T2 Negative Affect	13.21 (2.58)	13.40 (3.73)	13.11 (2.34)	13.56 (3.55)	
T2 SUDS	8.25 (15.42)	15.18 (19.17)	7.21 (13.29)	14.10 (18.79)	1 < 4, 3 < 4
Post-Distress Task					
T3 Positive Affect	21.46 (7.46)	19.93 (6.74)	21.73 (7.06)	21.56 (7.62)	1 = 2 = 3 = 4
T3 Negative Affect	17.06 (4.51)	16.68 (5.01)	16.20 (4.11)	16.75 (5.17)	1 = 2 = 3 = 4
T3 SUDS	24.75 (23.66)	28.93 (28.01)	20.72 (21.66)	28.12 (24.79)	1 = 2 = 3 = 4

Table 10. cont.

Measure	Group/Condition				
	Group 1[a]	Group 2[a]	Group 3[a]	Group 4[a]	Post Hoc[b]
Post-Mindfulness II					
T4 Decentering	16.57 (5.54)	19.21 (6.56)	20.19 (5.60)	17.80 (6.50)	3 > 4
T4 Curiosity	13.79 (5.22)	17.28 (6.30)	18.36 (5.74)	15.72 (5.90)	3 > 4
T4 Positive Affect	18.13 (7.15)	19.49 (7.61)	21.55 (6.91)	17.04 (6.23)	3 > 4
T4 Negative Affect	13.17 (2.94)	12.53 (2.45)	12.82 (2.04)	13.24 (3.41)	
T4 SUDS	13.35 (17.55)	9.10 (15.40)	6.68 (12.63)	16.06 (21.92)	2 < 4, 3 < 4

Note. One-way ANOVA with post hoc tests.
[a] Group 1: Pre-distress mindfulness; Group 2: Post-distress mindfulness
Group 3: Pre- and post-distress mindfulness; Group 4: Control
[b] The numbers in the post hoc column refer to significant pair-wise group comparisons with Dunnett's procedure.

Mixed-Model ANOVA Analysis

In addition to the between-groups analysis already reported, analyses using mixed-model ANOVAs were completed to assess the main effects of group assignments, changes across time among subjects, and interaction effects. A series of 4 (Group) x 4 (Time) mixed ANOVAs were conducted to assess Subjective Distress, Positive Affect, and Negative Affect. Two additional 4 (Group) x 2 (Time) mixed analyses of variance were conducted to assess the four groups across two time points (after the first [T2] and second [T4] mindfulness/control conditions) on the two subscales of TMS, measuring State Mindfulness. For all the following analyses, mixed-model ANOVAs were conducted with Time as the within-subjects variable and Group as the between-subjects variable.

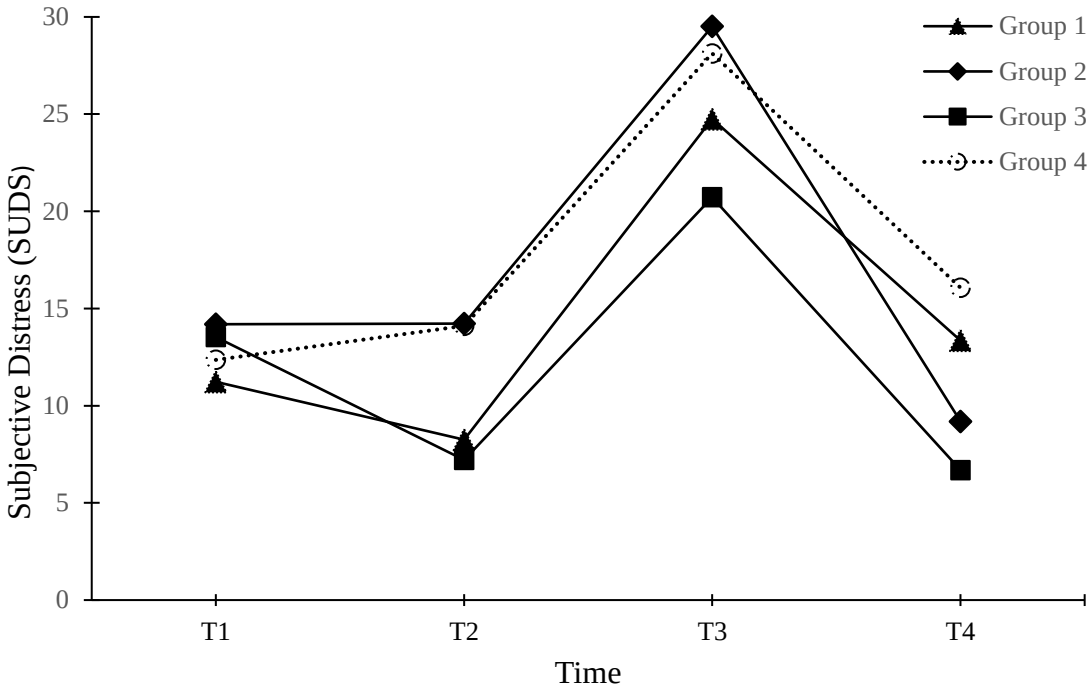
Subjective Distress. A mixed 4 (Group) x 4 (Time) ANOVA indicated that there was a significant main effect of Group, $F(3, 395) = 2.774$, $p < .05$, $\acute{\omega}^2 = .005$. There was a significant main effect of Time, $F(3, 1185) = 103.626$, $p < .001$, $\acute{\omega}^2 = .115$. There was an interaction of Time x Group, $F(9,1185) = 3.54$, $p < .01$, $\acute{\omega}^2 = .012$. Post hoc tests using Tukey HSD indicated no effects at Time 1, which was the baseline measure. At Time 2, the mean subjective distress of Group 4 (control condition) was higher than that of Groups 1 and 3, who received the 19-minute mindfulness condition. Furthermore, the Subjective Distress of Group 2 (control condition) was also higher that of than Groups 1 and 3. At Time 3, Groups 2 and 4 exhibited lower Subjective Distress than Group 3. At Time 4, Groups 2 and 3 endorsed lower Subjective Distress than Group 4, while Group 3 exhibited lower Subjective Distress than Group 1. Means and standard deviations are reported in Table 11 and estimated marginal means across the four time points are indicated in Figure 2.

Table 11. Summary of Means (and Standard Deviations) of SUDS by Group over Time

Measure	Group/Condition			
	Group 1	Group 2	Group 3	Group 4
T1 SUDS	12.20 (14.57)	14.24 (18.14)	14.06 (21.14)	12.36 (18.43)
T2 SUDS	9.55 (16.67)	15.18 (19.96)	8.58 (14.38)	14.86 (19.01)
T3 SUDS	24.75 (23.66)	28.93 (28.01)	20.72 (21.66)	28.12 (24.79)
T4 SUDS	13.35 (17.55)	9.10 (15.40)	6.68 (12.63)	16.06 (21.92)

Note: Group 1: Pre-distress mindfulness; Group 2: Post-distress mindfulness
Group 3: Pre- and post-distress mindfulness; Group 4: Control

Figure 2. Subjective Distress as a Function of Group and Time

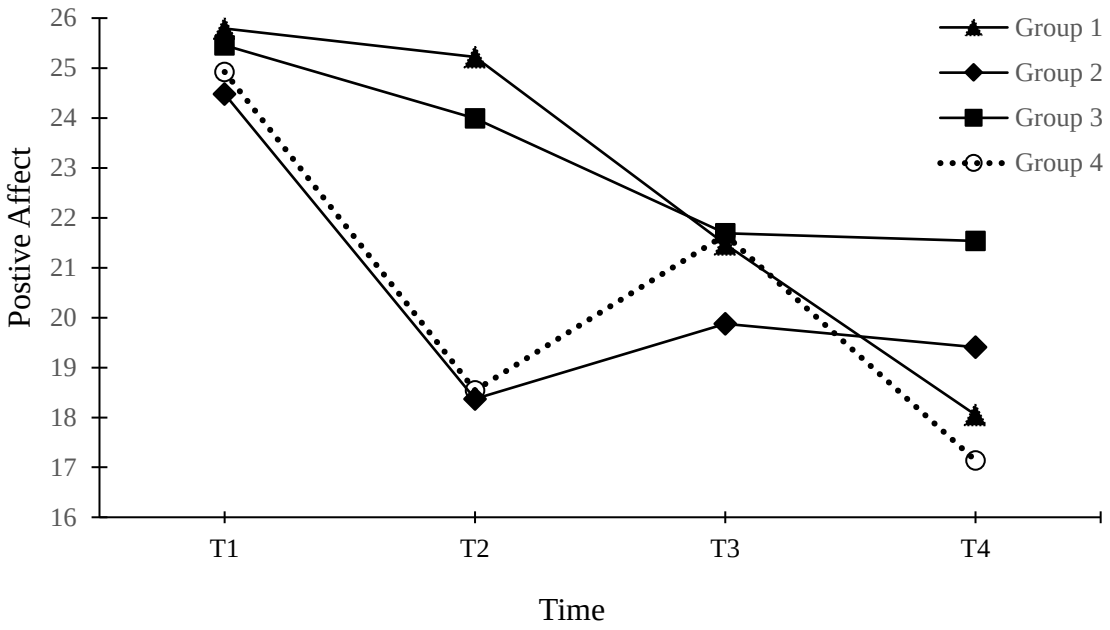


Note: Group 1: Pre-distress mindfulness; Group 2: Post-distress mindfulness
Group 3: Pre- and post-distress mindfulness; Group 4: Control

Positive Affect. A 4 (Group) x 4 (Time) mixed ANOVA test indicated there were significant main effects for Group, $F(3, 391) = 5.741$, $p < .05$, $\acute{\omega}^2 = .007$ and Time, $F(3, 1173) = 147.024$, $p < .001$, $\acute{\omega}^2 = .112$ along with a significant interaction of Time and Group, $F(9,1173) = 18.65$, $p < .01$, $\acute{\omega}^2 = .044$. Post hoc tests using Tukey HSD yielded no significant differences at Time 1, which was the baseline measure. At Time 2, Groups 1 and 3, who participated in the first mindfulness intervention, were significantly higher in Positive Affect than Groups 2 or 4, who received the control condition. At Time 3, after the distress task, there were no significant differences between the groups in relation to Positive Affect. At Time 4, there were significant differences between all of the groups. Group 3, who participated in mindfulness both before and after the distress task, demonstrated significantly higher mindfulness than Groups 1, 2, and 4.

Means and standard deviations are reported in Table 12, and estimated marginal means across the four time points are shown in Figure 3.

Figure 3. Positive Affect as a Function of Group and Time



Note: Group 1: Pre-distress mindfulness; Group 2: Post-distress mindfulness
Group 3: Pre- and post-distress mindfulness; Group 4: Control

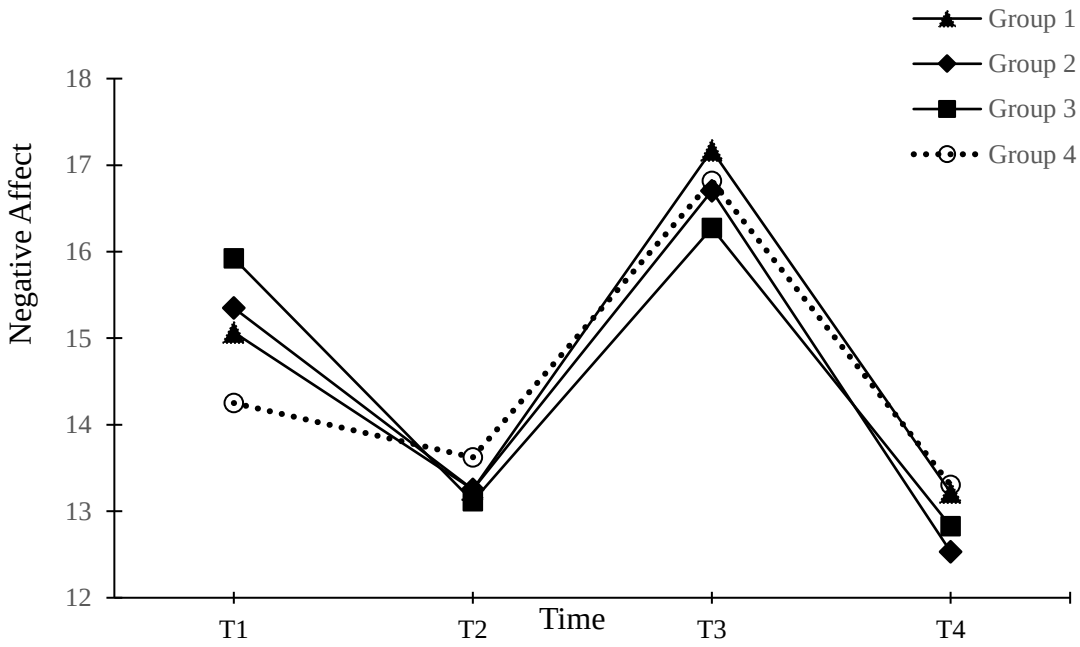
Table 12. Means (and Standard Deviations) of Positive Affect by Group over Time

Measure	Group/Condition			
	Group 1	Group 2	Group 3	Group 4
T1 Positive Affect	26.01 (6.92)	24.48 (6.32)	25.49 (5.99)	24.92 (6.69)
T2 Positive Affect	25.39 (7.37)	18.51 (6.88)	24.01 (6.76)	18.44 (6.57)
T3 Positive Affect	21.46 (7.46)	19.93 (6.74)	21.73 (7.06)	21.56 (7.62)
T4 Positive Affect	18.13 (7.15)	19.49 (7.61)	21.55 (6.91)	17.04 (6.23)

Note: Group 1: Pre-distress mindfulness; Group 2: Post-distress mindfulness;
Group 3: Pre- and post-distress mindfulness; Group 4: Control

Negative Affect. A mixed 4 (Group) x 4 (Time) mixed ANOVA indicated that there was no main effect for Group. However, there was a significant main effect of Time, $F(3, 1173) = 138.072$, $p < .001$, $\acute{\omega}^2 = .151$. Differences between all of the time points were significant. Specifically, considering the effect of Time, the Groups displayed a similar trend for Negative Affect, which declined between Time 1 and Time 2, increased at Time 3, and decreased at Time 4. Overall, participants experienced the highest level of Negative Affect at Time 3 (after the distress task), followed by Time 1 (baseline), Time 2 (after the first mindfulness/control condition), and Time 4 (after the second mindfulness/control condition). Estimated marginal means across the four time points are presented in Figure 4 and Table 13.

Figure 4. Negative Affect as a Function of Group and Time.



Note: Group 1: Pre-distress mindfulness; Group 2: Post-distress mindfulness
Group 3: Pre- and post-distress mindfulness; Group 4: Control

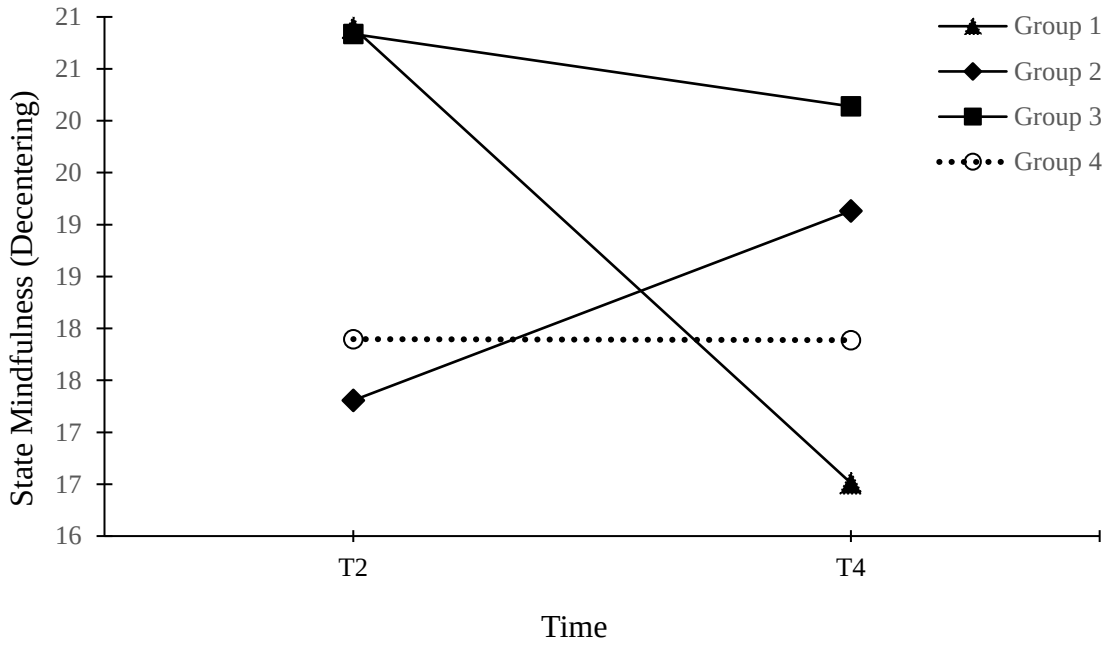
Table 13. Means (and Standard Deviations) of Negative Affect by Group over Time

Measure	Group/Condition			
	Group 1	Group 2	Group 3	Group 4
T1 Negative Affect	15.05 (4.04)	15.47 (5.44)	15.92 (4.73)	15.18 (3.79)
T2 Negative Affect	13.21 (2.58)	13.40 (3.73)	13.11 (2.34)	13.56 (3.55)
T3 Negative Affect	17.06 (4.51)	16.68 (5.01)	16.20 (4.11)	16.75 (5.17)
T4 Negative Affect	13.17 (2.94)	12.53 (2.45)	12.82 (2.04)	13.24 (3.41)

Note: Group 1: Pre-distress mindfulness; Group 2: Post-distress mindfulness
Group 3: Pre- and post-distress mindfulness; Group 4: Control

State Mindfulness - Decentering. A 4 (Group) x 2 (Time) mixed ANOVA indicated that there was a significant main effect for Group, $F(3, 394)=2.754$, $p < .05$., $\acute{\omega}^2 = .007$. There was also a significant main effect of Time, $F(1, 395)=11.291$, $p < .05$, $\acute{\omega}^2 = .005$. In addition, there was an interaction between Time and Group, $F(3,394)=28.667$, $p <.01$, $\acute{\omega}^2 = .040$. Post hoc tests using Tukey HSD were conducted. At Time 2, after the first mindfulness intervention, Groups 1 and 3 had significantly higher Decentering scores than Groups 2 and 4, who were assigned a control condition. At Time 4, Group 3 (mindfulness before/after distress) had the highest mean scores, followed by Group 2 (mindfulness after distress), Group 4 (control), and Group 1 (mindfulness before distress), as shown in Figure 5. Means and standard deviations are reported in Table 14 and estimated marginal means across the four time points are indicated in Figure 5.

Figure 5. State Mindfulness (Decentering) as a Function of Group and Time



Note: Group 1: Pre-distress mindfulness; Group 2: Post-distress mindfulness
Group 3: Pre- and post-distress mindfulness; Group 4: Control

Table 14. Means (and Standard Deviations) of TMS Decentering by Group over Time

Measure	Group/Condition			
	Group 1	Group 2	Group 3	Group 4
T2 Decentering	20.90 (5.09)	17.31 (5.23)	20.84 (4.60)	17.90 (5.16)
T4 Decentering	16.57 (5.54)	19.21 (6.56)	20.19 (5.60)	17.80 (6.50)

Note: Group 1: Pre-distress mindfulness; Group 2: Post-distress mindfulness
Group 3: Pre- and post-distress mindfulness; Group 4: Control

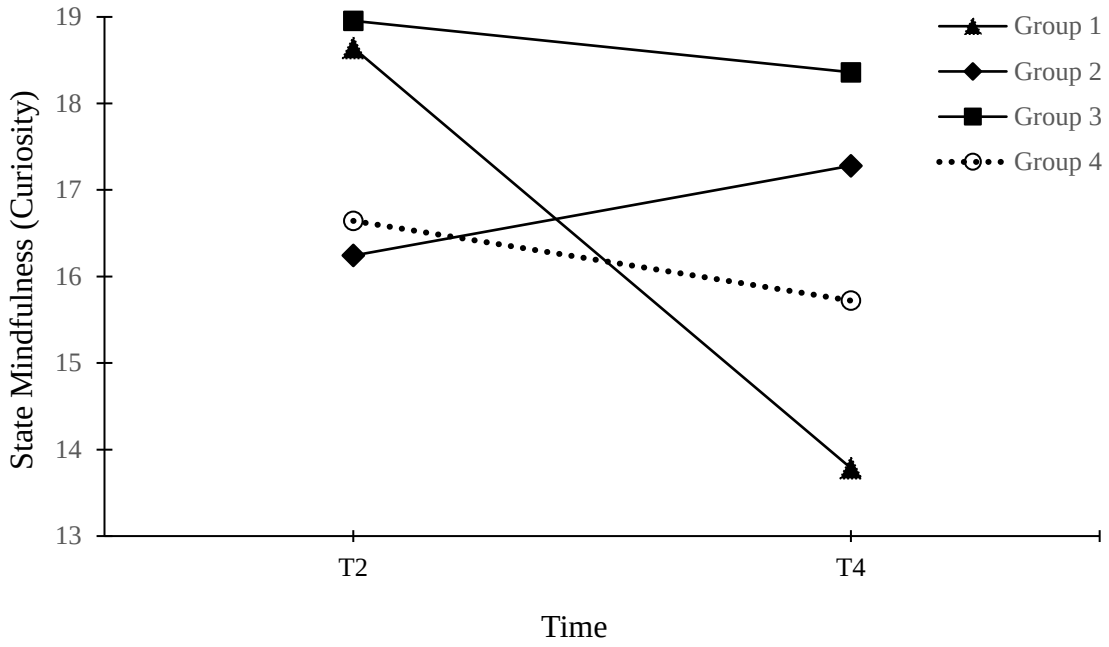
State Mindfulness – Curiosity. A mixed 4 (Group) x 2 (Time) ANOVA indicated that there was a significant main effect for Group, $F(3, 396) = 5.601$, $p < .05$, $\acute{\omega}^2 = .007$. There was a significant main effect of Time, $F(1, 396) = 32.716$, $p < .001$, $\acute{\omega}^2 = .015$. There was an interaction between Time and Group, $F(3,396) = 28.674$, $p < .010$, $\acute{\omega}^2 = .038$. Tukey's HSD was completed as a post hoc test. At Time 2, after the first mindfulness intervention, Groups 1 and 3 had significantly higher Curiosity scores than Groups 2 and 4, who were assigned a control condition. At Time 4, Group 3 had the highest mean scores, followed by Groups 2, 4, and 1, as shown in Figure 6. The Curiosity subscale followed a similar pattern to the Decentering subscale of state mindfulness. Means and standards deviations are reported in Table 15 and estimated marginal means across the four time points are shown in Figure 6.

Table 15. Means (and Standard Deviations) of the TMS Curiosity by Group over Time

Measure	Group/Condition			
	Group 1	Group 2	Group 3	Group 4
T2 Curiosity	18.64 (4.88)	16.24 (5.52)	18.95 (5.34)	16.64 (4.90)
T4 Curiosity	13.79 (5.22)	17.28 (6.30)	18.36 (5.74)	15.72 (5.90)

Note: Group 1: Pre-distress mindfulness; Group 2: Post-distress mindfulness
Group 3: Pre- and post-distress mindfulness; Group 4: Control

Figure 6. State Mindfulness (Curiosity) as a Function of Group and Time



Note: Group 1: Pre-distress mindfulness; Group 2: Post-distress mindfulness
Group 3: Pre- and post-distress mindfulness; Group 4: Control

Table 16. Summary of Means (and Standard Deviations) of the Dependent Variables

Measure	Group/Condition			
	Group 1	Group 2	Group 3	Group 4
T1 SUDS	12.20 (14.57)	14.24 (18.14)	14.06 (21.14)	12.36 (18.43)
T2 SUDS	9.55 (16.67)	15.18 (19.96)	8.58 (14.38)	14.86 (19.01)
T3 SUDS	24.75 (23.66)	28.93 (28.01)	20.72 (21.66)	28.12 (24.79)
T4 SUDS	13.35 (17.55)	9.10 (15.40)	6.68 (12.63)	16.06 (21.92)
T1 Positive Affect	26.01 (6.92)	24.48 (6.32)	25.49 (5.99)	24.92 (6.69)
T2 Positive Affect	25.39 (7.37)	18.51 (6.88)	24.01 (6.76)	18.44 (6.57)
T3 Positive Affect	21.46 (7.46)	19.93 (6.74)	21.73 (7.06)	21.56 (7.62)
T4 Positive Affect	18.13 (7.15)	19.49 (7.61)	21.55 (6.91)	17.04 (6.23)

Table 16. cont.

Measure	Group/Condition			
	Group 1	Group 2	Group 3	Group 4
T1 Negative Affect	15.05 (4.04)	15.47 (5.44)	15.92 (4.73)	15.18 (3.79)
T2 Negative Affect	13.21 (2.58)	13.40 (3.73)	13.11 (2.34)	13.56 (3.55)
T3 Negative Affect	17.06 (4.51)	16.68 (5.01)	16.20 (4.11)	16.75 (5.17)
T4 Negative Affect	13.17 (2.94)	12.53 (2.45)	12.82 (2.04)	13.24 (3.41)
T2 Decentering	20.90 (5.09)	17.31 (5.23)	20.84 (4.60)	17.90 (5.16)
T4 Decentering	16.57 (5.54)	19.21 (6.56)	20.19 (5.60)	17.80 (6.50)
T2 Curiosity	18.64 (4.88)	16.24 (5.52)	18.95 (5.34)	16.64 (4.90)
T4 Curiosity	13.79 (5.22)	17.28 (6.30)	18.36 (5.74)	15.72 (5.90)

Note: Group 1: Pre-distress mindfulness; Group 2: Post-distress mindfulness
Group 3: Pre- and post-distress mindfulness; Group 4: Control

CHAPTER IV

DISCUSSION

The present study examined the impact of brief mindfulness treatments on measures of state mindfulness (curiosity and decentering), subjective distress, and negative and positive affect relative to the control conditions. Based on previous research, it was hypothesized that all of the mindfulness treatment groups would exhibit higher state mindfulness, lower subjective distress, lower negative affect and higher positive affect than the control group. Furthermore, at the end of the study, the cumulative effect of the three mindfulness treatments (before distress, mindfulness after distress and mindfulness both before and after distress) on state mindfulness (curiosity and decentering), subjective distress, and negative and positive affect were compared.

State Mindfulness

The results supported hypothesis 1a, which predicted that state mindfulness (both decentering and curiosity) before a distress task would be higher than a control group. Similarly, the results supported hypothesis 2a, which proposed that state mindfulness after a distress task would be higher than in a control group. Finally, the results supported hypothesis 3a, which projected that overall, preventive and recovery mindfulness would be higher than in the control group. The impact of brief mindfulness has yielded mixed results in previous research. In some studies, brief mindfulness has not always reliably induced increases in state mindfulness among participants in various samples, ranging from a clinical sample with Generalized Anxiety Disorder (Lee & Orsillo, 2014) to an undergraduate student non-clinical sample (Schimmelpfenning, 2018).

Some prior research utilized active control conditions such as Progressive Muscle Relaxation (PMR), while this study used a history podcast. Active control conditions, such as PMR, may also be effective in reducing stress, anxiety, and negative affect (Gao, Curtiss, Liu, X & Hofmann, 2018), though the mechanisms of relaxation differ from the mechanisms of mindfulness. Particularly in single treatments of a short duration, state mindfulness and PMR, which is also a therapeutic technique, may produce similar outcomes in relation to affect and subjective distress. However, that is less likely on measures of state mindfulness, since decentering is considered a potential mechanism that is unique to mindfulness interventions (Gao et al., 2018). Thus, differences between intervention and active control may be more difficult to detect when using active control conditions in brief mindfulness studies.

Subjective Distress

At the end of the treatment versus control protocol, hypotheses 1b, 2b, and 3b were supported. As predicted, subjective distress for all treatment groups was lower than for the control condition. Of the treatment conditions, the combination of preventive and recovery mindfulness (Group 3) resulted in the lowest subjective distress, followed by only recovery mindfulness (Group 2) and only preventive mindfulness (Group 1).

Negative Affect

Similar to subjective distress, negative affect was hypothesized to be lower after the mindfulness conditions. However, none of the hypotheses (1c, 2c, 3c) were supported. In the timeframe of a one-hour laboratory study, it may be that negative affect is not so easily influenced. Overall, across all groups, negative affect decreased between baseline and the end of the study. This suggests that students may experience some negative affect when conducting a laboratory study, in general, and that negative affect subsides over the course of both treatment

and control conditions as subjects may anticipate the completion of the study. Across groups, at Time 2, there was a decline in negative affect. Perhaps subjects were relieved to complete the first task of the study regardless of whether it involved mindfulness or a history podcast. As expected, all groups experienced an increase in negative affect after completing the PASAT task; however, there was no difference between treatment and control conditions. Furthermore, all groups experienced a decrease in negative affect after the second mindfulness or control condition.

In a meta-analysis, Schumer et al. (2018) investigated whether brief mindfulness interventions reliably reduce negative affect. Overall, across their meta-analysis, the authors found a small yet significant effect of brief mindfulness interventions on decreasing negative affect relative to control conditions. However, that effect was moderated by sample type; student samples exhibited smaller effects than community samples. The authors further stated that publication bias signals that more published studies are needed to evaluate whether this effect is indeed reliable and robust. The findings in the current study did not indicate significant differences in negative affect between groups; however, there were differences in subjective distress. This suggests that while subjective distress was differentially influenced between groups, overall negative affect was not.

Another consideration, when evaluating the study findings on negative affect, was how negative affect was measured and what that measure captured and reflected. Based on a review of the past research on the PANAS (Mehrabian, 1997), negative affect may represent a higher order (or second order) factor incorporating the first order factors representing Afraid and Upset. The items for the Afraid factor were scared, nervous, afraid, guilty, ashamed, and jittery; the items for the Upset factor were distressed, irritable, hostile, and upset. Thus, in future research,

group differences could be tested using these first order factors to determine any differences in negative affect at the sub-scale level. In summary, differences in subjective distress were detected in the current study between groups, but not on the broader measure of negative affect.

Positive Affect

Hypothesis 1d was not supported. Preventive mindfulness did not result in significantly higher positive affect compared to the control group. Hypothesis 2d was supported, as recovery mindfulness resulted in higher positive affect than the control group. Hypothesis 3d was also supported, as the combination of preventive and recovery mindfulness resulted in higher positive affect than the control group. Interestingly, positive affect diminished for all groups across the study. However, after the distress task, the groups receiving recovery mindfulness experienced stable positive affect, while the groups who did not receive mindfulness continued a declining trend in positive affect.

Loving-kindness forms of mindfulness exercises are built around enhancing positive emotional states such as kindness and compassion (Hofmann, Grossman, & Hinton, 2011). While some forms of brief mindfulness encourage nonjudgmental awareness of experiences in the present moment by focusing on bodily or other sensorial experience, affective states, thoughts, or images, loving-kindness focuses awareness upon alleviating suffering and expressing loving and kind concern for both oneself and others. Thus, as in the current study, engaging in a loving-kindness form of mindfulness after distress may be helpful for improving positive emotions.

Summary of Trends

In the current study, relative to control conditions, an initial 19-minute brief mindfulness intervention was effective in inducing state mindfulness. Specifically, at the sub-scale level,

curiosity and decentering followed similar patterns, as depicted in Figures 5 and 6. At Time 4, after the distress task and second dose of the mindfulness/control condition, the state mindfulness of Group 3 had decreased slightly over time but was the highest state mindfulness of all the groups. The state mindfulness of Group 2 increased over time but was lower than Group 3 at Time 4. In Group 4, the control group's state mindfulness did not change over time. Remarkably, the state mindfulness of Group 1 declined the most over time and by Time 4 was significantly lower than all of the other groups. This suggests that brief mindfulness before a distressing task might decrease quite sharply to even lower levels compared to groups practicing no mindfulness at all, thus suggesting that brief mindfulness might be contra-indicated before distress. However, brief mindfulness both before and after a distress task or brief mindfulness after a distress task resulted in higher levels of mindfulness overall relative to no mindfulness at all or mindfulness only before a distress task.

In summary, the results of this study contribute to the existing brief mindfulness research literature in several ways. First, this is the first study to induce state mindfulness and observe effects on state mindfulness, subjective distress, and negative and positive affect both before and after a laboratory stressor. Overall, the treatment condition utilizing brief mindfulness both before and after a stressor (Group 3) produced the most efficacious results in terms of state mindfulness, subjective distress, and positive and negative affect in the present study. The second most effective treatment condition was mindfulness after a stressor (Group 2). Unexpectedly, preventive mindfulness (without recovery mindfulness) resulted in lower state mindfulness than both the other treatment groups and the control group. This may be attributed to the contrast between reaching a state of mindfulness, undergoing distress, and then proceeding to a control task. Anecdotal evidence collected through the observations of laboratory assistants

suggested that the control task was also somewhat tedious (e.g., “boring topic,” “no plot,” “not interesting”) to the participants. The control group was already accustomed to the history audio recording; thus, resuming that activity after the distress task was in contrast to the treatment group that first experienced mindfulness, followed by distress and a history podcast.

Clinical Implications

Brief mindfulness exercises are currently incorporated as one component of therapy in treatment modalities such as ACT, DBT, and MBCT (Hayes et al., 2011). Such exercises are utilized in small doses in sessions, though therapy clients may also be encouraged to engage in mindfulness practice outside of therapy sessions. The greatest effects on well-being are likely gained over thousands of hours of meditation practice (Lutz, McFarlin, Perlman, Salomons, & Davidson, 2013). However, in clinical populations, brief mindfulness exercises and long-term mindfulness practice may not be embraced by individuals seeking therapeutic interventions for acute distress. Thus, understanding the emerging best practices for introducing mindfulness is critical. For example, researchers (Harel, Hadash, Levi-Belz, & Bernstein, 2019) found that in a 4-week mindfulness training intervention, the greater degree of increased positive affect early in mindfulness training sequence led to higher levels of mindfulness over the duration of the intervention. Since the benefits of mindfulness practice accrue over time, the acceptability of early mindfulness experiences among novices may increase the likelihood of mindfulness activities evolving into a long-term practice. Moreover, it is important to understand how to introduce and utilize mindfulness activities of shorter duration and in the context of therapy sessions. Importantly, better understanding the potential effects of the timing and duration of brief mindfulness activities could aid clinical practitioners, particularly those clinicians who

incorporate brief mindfulness exercises in their treatment planning for individuals with psychopathology.

The idea of "distress" used in the study may generalize to other stressful circumstances encountered during therapy sessions, such as engaging in exposure therapy, recalling unpleasant memories, and experiencing difficult interpersonal interactions in therapy sessions. The current study indicates that in a laboratory setting, brief mindfulness is effective when designed as a recovery treatment or a combined preventive and recovery treatment in the context of distress. However, according to the findings of this study, utilizing brief mindfulness as a treatment within a treatment session of short duration (i.e., approximately one hour) to reduce the negative psychological outcomes related to distress may be contraindicated if there is not also an opportunity to utilize mindfulness as a recovery treatment after distress.

For clinical practice, the results of this study provide evidence that a brief mindfulness-based intervention may complement therapeutic interventions to reduce subjective distress after a stressful experience. One of the key skills taught in mindfulness-based therapies concerns how to regulate difficult thoughts and emotions (Chiesa, Serretti, & Jakobsen, 2013). In the current study, brief doses of mindfulness before and after stress appeared efficacious. However, a brief dose of mindfulness before a stressor may result in iatrogenic effects. It is relevant to clinicians to better understand how brief mindfulness works before and after distress to ensure that they do no harm when attempting to introduce brief mindfulness activities in therapeutic interventions. In clinical contexts, mindfulness may be important in the context of distress. Although these laboratory results may not generalize to clinical treatment settings, they do raise important questions regarding the timing and duration of brief mindfulness in the therapeutic context. An important finding of this study is that it may be more beneficial to engage in brief mindfulness at

the end of a stressful experience, which may generalize to other stressful experiences, including therapy experiences. Perhaps the most beneficial treatment is a combination of mindfulness, both at the beginning and the end of a therapy session. Importantly, mindfulness meditation is typically viewed as a practice, suggesting that mindfulness interventions might be most effective if introduced in small doses and amplified over time (Howarth et al., 2019).

Limitations

A homogeneous sample population of undergraduate students was recruited for this study, thereby limiting the generalizability of the results with respect to other populations. The demographics of the sample consisted of a majority of White, female participants in a university setting, which further limits the generalizability of the results. To improve generalizability, future research must involve more diverse samples.

The study took place in a single lab session. Measuring the same dependent variables across multiple time points raised concerns about sensitizing the subjects, particularly with multiple administration of the mindfulness measures. Sensitization is particularly a concern within-subjects (Greenwald, 1976). In the control condition, state mindfulness remained constant on the decentering subscale and declined slightly on the curiosity subscale over time. However, subjects also completed a trait mindfulness measure at baseline, which may have sensitized them to the notion of mindfulness. A recent meta-analysis (Baer, Gu, Cavanagh, & Strauss, 2019) found partial support for the differential sensitivity of mindfulness measures to change with treatment. At times, psychosocial interventions other than mindfulness interventions have resulted in increases on mindfulness measures, suggesting that other psychosocial interventions may also cultivate mindfulness.

In terms of the type of brief mindfulness used, the neuroscience literature suggests that thousands of hours of mindfulness training may be necessary to produce lasting effects on the brain. However, loving-kindness and compassion meditations yield effects on the brain after only hours of training. Weng et al. (2013) found activation in right inferior parietal cortex (IPC) and right dorsolateral prefrontal cortex (DLPFC) as a result of loving-kindness meditation one hour per day for a week (20 minutes per meditation) compared to a control group. In that study, compassion (i.e., loving-kindness) training resulted in greater altruistic behavior due to an increased engagement of neural systems implicated in understanding the suffering of other people (social cognition), executive and emotional control, and reward processing. In the current study, the brief loving-kindness/compassion exercise was designed to reduce negative psychological outcomes after distress; however, this study did not include neuroscience or physiological measures. Mindfulness instructions were limited to what was provided to participants in the audio tracks. Brief mindfulness is an inherent limitation. Ideally, mindfulness training occurs in multiple sessions over time with incremental progress rather than in a single session. However, briefer forms of mindfulness may be useful in situations in which a longer intervention is not available or realistic for a given population in a given context (e.g., therapy or work settings).

Future Research

Further studies with samples from more diverse populations, including clinical samples, are needed to gain deeper knowledge concerning brief mindfulness interventions and their influence on psychological variables (Jiménez, Ramos, González-Moraleda & Resurrección, 2020). Ideally, this study would be replicated with a clinical sample. For example, single-session mindfulness meditation interventions reduced psychological distress in response to

mood inductions and challenging tasks compared to control conditions in a clinical sample experiencing depression (e.g., Huffziger & Kuehner, 2009). Furthermore, beyond lab-generated distress, field studies designed to study the influence of distress outside laboratory settings would increase ecological validity.

Dosage of mindfulness is among one of the most important practical questions regarding the dissemination of mindfulness-based interventions, yet this area of research has not garnered substantial attention (Davidson & Dahl, 2018). Overall, meditators practicing over time have accrued the greatest benefits (Brand, Holsboer-Trachsler, Naranjo, & Schmidt, 2012; Chaix et al., 2017; Kral et al., 2018; Luders et al., 2012; Luders, Cherbuin, & Gaser, 2016; Lykins, Baer, & Gottlob, 2012). Importantly, the ideal dosage along with the sequence of brief mindfulness interventions remains largely under-researched.

In future research, it would be interesting to test any potential differences between audio-recorded instructions as opposed to live instructions in the presence of a therapist trained in mindfulness and whether the recorded versus live delivery method of the brief mindfulness-based intervention influences state mindfulness, subjective distress, and affect. In a clinical setting for cancer patients, a therapeutic alliance predicted reductions in psychological distress in a program of MBCT (Bisseling et al., 2019). In a laboratory setting, perhaps an alliance with an instructor or therapist trained in mindfulness with active teaching of the tenets of mindfulness along with social support, if offered in a group setting, would be more effective than audio-recorded instructions. A better understanding the efficacy of the methods employed to deliver mindfulness training could improve both the research applications and clinical practice of brief mindfulness interventions.

Mindfulness may aid both in emotional and physiological recovery from distress (Creswell et al., 2017). Including physiological measures in a modified version of the current study would contribute to the understanding of these combined effects beyond self-reported measures. Furthermore, this approach would allow researchers to triangulate physiological measures with self-reported psychological outcomes, which may reflect social desirability bias or demand effects. To add to the neuroscience literature, investigating small doses of loving-kindness mindfulness is particularly intriguing to determine the lowest threshold of potential effects of brief mindfulness.

The research design from the current study could be modified and applied to study the efficacy of brief mindfulness before and after distress, along with the cumulative effects of both forms of mindfulness in clinical as well as nonclinical settings. For example, this approach could be tested in a workplace setting, where the stressor might be a difficult interaction with a supervisor. Perhaps engaging in brief mindfulness before and after various types of stressors might be effective during those encounters and may further serve as a preventive measure to reduce the likelihood of psychopathology (e.g., depression and anxiety) developing due to difficult interpersonal relationships in the workplace or other settings.

APPENDICES

Appendix A

Complete Meditation Instructions

Begin this meditation by finding your meditation posture

Comfortable yet upright

Relaxed, present

You can notice your body, seated here

Noticing the weight and movement and touch

Letting your attention sink into your body

Feeling it as though from the inside

Relaxing

And then exploring

What is here what is true for you

In this moment

Let your attention gently come to rest on your breathing

Your breath is your anchor

And it's your focus that you can always return to

It's your homebase

So feel the gentle rising and falling of your breath

In your abdomen or chest

Or the in and out sensations located at your nostrils

So we feel one breath after the next

One breath at a time

With a curious attention

What does one breath feel like in this very moment

Now we can also open our attention to a variety of other experiences

When they become predominant

Or obvious

When they become more predominant than the breath itself

So you might notice sounds from the outside

Inside your room, outside your home

You might notice sounds pulling your attention away

So you can listen to the sound

Let go of the breath and listen to the sound

When it no longer holds your attention

Then return back to the breath

If a body sensation gets strong

Becomes predominant, pulls your attention away from the breath

Again, let go of the breathing

No need to be intention with breath or the body sensation

Just go naturally

Let your body go to the body sensation

Feel it

Sense it

Notice it

What happens, does it grow or shrink?

Expand

Increase, decrease

Does it shift into something else?

When it no longer holds your attention

Come back to the breathing

The simplicity of the breath

It's always available to you

If while you're sitting, an emotion becomes strong and obvious

That can be what you focus on

You can bring your attention to the emotion

So again letting go of the breath or whatever else you were focusing on

And paying attention to that emotion

Specifically, feel it in your body

Investigate in your body how you feel this emotion

You might notice some clenching or tightness in your belly

Maybe there's some vibration or tension in your chest

Maybe your throat feels tight

Maybe your face is warm

There's all sorts of sensations in our bodies to pay attention to when we're having an emotion

You can label that emotion

Fear

Sadness

Irritation

Whatever it is

Labeling it and feeling in your body what's happening

When the emotion no longer has a hold on you

Or something else pulls your attention

Or it's stopped

You can go to that new thing that's pulled your attention

For instance a new body sensation or sound

Or you can always return to the breathing

Just come back to homebase

To your anchor

Now if thoughts become obvious

Sometimes thoughts are just in the background

In which case there's nothing to do really

Just stay with being with your breath

Sometimes you notice that you're lost in thought

And you can use the word "thinking"

Or "wandering"

And then return your attention right back to your breath

But if a thought is repetitive

You can begin to label the thoughts

Worrying

You're exploring your own mind

With curiosity and openness

So we'll try this for some time now [silence]

If you find yourself lost in thought

It's not a problem, just relax

Notice your thinking

Really kindly, return your attention right back to whatever is happening in this present moment

You might find that you move from one thing to the next

Planning

Remembering

Sometimes in the act of labeling them

They disappear

Sometimes they continue on

If the thought keeps going

In a repetitive way

You might check into your body and see if there are body sensations to notice

Let yourself be curious

About the thoughts arising

Coming and going

If it feels like too much always return to the breath

So as you do this practice

The breath is your anchor

And no matter what's happening in your awareness

Whether it's sounds or body sensations

Or emotions or thoughts

You can always find that place to return to

You might also notice

If there's an attitude or mood in your mind

Like a sense of restlessness or sleepiness

Or just a general feeling

Like sadness

Notice if these mental states color your experience

You can pay attention to them too

So we'll sit together now in silence

Remembering to keep your attention mostly focused on your breath

And then if a sound or body sensation

Emotion, thought

Or obvious mental state or mood

If they become evident

Predominant

Let go of the breathing

Notice whatever it is that's happening

When it's stopped or no longer holds your attention

Return to the breath

And just relax

And have fun, be curious

There's a sound, a body sensation, a thought, an emotion

And then return to your breath

Trust in this natural flow of your experience

As we relax and witness with curiosity

Our life unfolding in front of us [silence]

So once again, notice your body

Here

Present

Present time awareness

Feeling your weight

Posture, shape

And then just invite in some kindness for yourself

Wishing yourself well

The best you can

Appreciating yourself

May I be happy and peaceful and at ease

May I be safe and protected from danger

May I be healthy and strong

May I be at ease

May we all be happy and peaceful

And safe and protected

Healthy, strong

At ease

[bell ring]

Appendix B

Loving-Kindness Meditation

To begin this practice

Let yourself be in a relaxed and comfortable position

We're going to do the practice of cultivating positive emotion

In this case, loving-kindness

Which is the desire for someone to be happy

Or yourself to be happy

It's not dependent on something, it's not conditional

It's just a natural opening of the heart

To someone else or to yourself

So you can check in to your body and notice how you're feeling right now

Letting whatever is here, be here

Now let yourself bring to mind

Someone whom, the moment you think of them, you feel happy

See if you can bring to mind

It could be a relative, a close friend

Some with not too complicated a relationship

Just a general sense, that when you think of them you feel happy

Can pick a child

Or you can always choose a pet

A dog or a cat

A creature it’s fairly easy to feel love for

So let them come to mind

Have them -- have a sense of them being in front of you

You can feel them, sense them, see them

And as you imagine them

Notice how you’re feeling inside

Maybe you feel some warmth

Or there’s some heat to your face

A smile, sense of expansiveness

This is a loving-kindness

This is a natural feeling that’s accessible to all of us at any moment

So now having this loved one in front of you

Begin to wish them well

May you be safe and protected from danger

May you be happy and peaceful

May you be healthy and strong

May you have ease and well-being

And as I say these words, you can use my words or your own words

And have a sense of letting this loving kindness come from you

And begin to touch this loved one

Reaching out

You might think in images

You might have a sense of color or light

You might just have a feeling

The words may continue to bring on more of this feeling

And I encourage you to say whatever feels meaningful to you

May you be free from stress and anxiety

May you be free from all fear

And so as you're sending out these words and these feelings of loving-kindness

Also check into yourself and see how you're feeling inside

And now imagine that this loved one turns around

And begins to send it back to you

So see if you can receive the loving-kindness

Take it in

And they're wishing you well, may you be happy

Meaning you

May you be peaceful and at ease

May you be safe and protected from all danger

May you have joy, well being

Letting yourself take it in

Now if you're not feeling anything at this point

Or before in the meditation

It's not a problem

This is a practice that plants seeds

And if you're feeling something else other than loving-kindness

Just check into that

What is it I'm feeling?

There may be something to learn here

Now if it's possible and it's not always easy to do this

But see if you can send loving kindness to yourself

You can imagine it coming down your body from your heart

You can just have a sense of it

May I be safe and protected from danger

May I be healthy and strong

May I be happy and peaceful

May I accept myself just as I am

And as you ask yourself the question "what do I need to be happy?"

See what arises

And offer that to yourself

May I have meaningful work

A joyful life

Close friends and family

And now checking into yourself

And noticing what it is you feel as you do this

And now let yourself bring to mind one person

Or a group of people that you wish to send the loving kindness to

Imagine them in front of you

Sense them, feel them

May you be happy and peaceful

May you be free from all stress and anxiety and fear

Worry

Grief

May you have joy and happiness

Well-being

And now let this loving kindness expand out

Spreading

Touching anyone that you want to touch right now

In all directions

People you know, people you don't know

People you have difficulty with

People you love

Just imagine expanding and touching

And each person or animal

Whoever is touched by this loving kindness

Each person is changed

You can imagine that

So may everyone everywhere be happy and peaceful and at ease

May we all experience great joy

[bell rings]

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