2019

An Investigation of the Relation between Mindfulness and Self-Esteem Stability

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An Investigation of the Relation between Mindfulness and Self-Esteem Stability

Cameron Ford, M.S.

Dissertation submitted to the Eberly College of Arts and Sciences at West Virginia University in
partial fulfillment of the requirements for the degree of Doctor of Philosophy in Clinical
Psychology

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Keywords: Mindfulness, Self-Esteem, Stability
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ABSTRACT

An Investigation of the Relation between Mindfulness and Self-Esteem Stability

Cameron Ford

Self-esteem stability is the magnitude of the short-term fluctuations in one's immediate feelings of self-worth (Kernis, 2005). Stable self-esteem is associated with several psychological benefits, such as lower depression (Kernis et al., 1998). However, it is unknown what factors lead to self-esteem stability. Because mindfulness promotes a nonjudgmental orientation whereby thoughts, feelings, and reactions are viewed as transient events that do not necessarily represent objective reality, mindfulness might be associated with more stable self-esteem. Thus, the present research examined the relation between mindfulness and self-esteem stability. Undergraduates ($N = 190$) were randomly assigned to one of three conditions: mindfulness training, cognitive training (active control), or null control condition in which no intervention was delivered. Then, participants completed measures of state self-esteem twice per day for ten days on their personal smartphones as a means of indexing self-esteem stability. The first aim of the study was to determine the association between trait mindfulness and self-esteem stability in participants in the null control condition. Results revealed small, inconsistent associations between mindfulness and self-esteem stability that became nonsignificant when controlling for mood variability, hassles, uplifts, and self-esteem level. The second aim of the study was to test whether mindfulness practice affected self-esteem stability. Results indicated that self-esteem became more stable across time. However, the improved stability in self-esteem did not differ by condition. Thus, there was no evidence that mindfulness training caused more stable self-esteem above placebo effects. Overall, results suggest a small association between mindfulness and self-esteem stability may exist, but brief mindfulness training may not improve self-esteem stability. Future studies with larger samples sizes and more intensive mindfulness interventions would help clarify the relation between mindfulness and self-esteem stability.

Acknowledgements

Throughout the writing of this dissertation I have received a great deal of support and assistance. This research was made possible by the WVU Department of Psychology Graduate Research Fund Award and the Eberly College of Arts and Sciences Doctoral Research Award. I would like to thank Dr. Natalie Shook, my advisor and dissertation chair, for her continued wisdom, dedication, mentorship, and guidance. I would also like to thank my committee members, Dr. Julie Brefczynski-Lewis, Dr. Amy Gentzler, and Kevin Larkin, for their contributions to this project. I am very grateful for the many research assistants who assisted with data collection, with a special thanks to Audrey Weiss, Nathan Altman, Moyo Jacobs, Anthony Perracchio, and Eva MacFarland who helped manage data collection procedures. Many thanks also to my colleagues and friends for all of their support. I especially grateful to my wife, Malissa Ford, for her support, encouragement, and inspiration during the many late nights with the office light on. Lastly, I also would like to thank my family for their endless supply of love and support.

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An Investigation of the Relation between Mindfulness and Self-Esteem Stability

In recent decades, having high self-esteem has been seen as critically important, particularly in modern, Western cultures (Twenge, 2006). Although this cultural emphasis on building high self-esteem has some benefits, Twenge (2006) argues that growing up in such a cultural environment has had unintentional, negative consequences for recent generations. For example, Millennials possess higher levels of narcissism, anxiety, and loneliness than previous generations, which may partly stem from this cultural emphasis on self-esteem enhancement. Given these negative consequences, some have argued that self-esteem should be conceptualized in a different, more nuanced manner. For instance, the stability of self-esteem rather than just the level of self-esteem should be considered (Kernis, 2005). Self-esteem stability is the magnitude of the short-term fluctuations in one's immediate feelings of self-worth that individuals experience in their daily lives (Kernis, 2005). Indeed, self-esteem stability has been associated with a range of positive outcomes, such as reduced reactivity to daily stressful events even when controlling for self-esteem level (Greener et al., 1999) and reduced depression in stressful environments (Kernis et al., 1998). Thus, identifying correlates of self-esteem stability and interventions that increase self-esteem stability may help promote psychological health.

Mindfulness presents one plausible way to enhance self-esteem stability. Mindfulness refers to the tendency to direct attention to present moment experiences in a nonjudgmental manner (Bishop et al., 2006). As such, individuals higher in mindfulness should be less reactive to daily events (positive or negative), which may translate to less fluctuation in self-worth (i.e., self-esteem stability). Indeed, mindfulness is associated with a range of positive psychological health outcomes, including higher levels of self-esteem (e.g., Brown & Ryan, 2003). However, the relation between mindfulness and the stability of self-esteem is not well understood. Thus,

the primary purpose of the present research is to investigate the relation between mindfulness and self-esteem stability. Because mindfulness encourages an orientation to experiences whereby thoughts, feelings, and reactions are viewed as transitory events that are not necessarily reflections of reality, it was predicted that greater mindfulness would be related to more stable self-esteem.

Self-Esteem

Self-esteem has been a widely studied construct across the history of psychology. Discussion of self-esteem began with William James (1890) who wrote that “there is a certain average tone of self-feeling which each one of us carries about with him” (p. 309). More modern definitions refer to self-esteem as an individual’s evaluation of his/her own self-worth (Aronson, Wilson, & Akert, 2012). It is an evaluative judgment about oneself. High self-esteem describes a positive, favorable judgment about oneself. Low self-esteem describes a negative, unfavorable judgment about oneself. It is important to note that because self-esteem refers to one’s judgment of self-worth, it does not necessarily reflect reality. That is, if a person views himself or herself as unintelligent and boring (e.g., low self-esteem), this does not necessarily mean that the individual is unintelligent and boring in reality. Self-esteem is an evaluative self-judgment; it is a perception about one’s self-worth.

Self-esteem level is generally regarded as a fairly consistent trait-like characteristic (e.g., Kernis, 2005; Rosenberg, 1965), with high test-retest reliability over long periods of time (e.g., Helson & Moane, 1987; Kuster & Orth, 2012) and strong rank-order reliability across the lifespan (e.g., Block & Robins, 1993; Trzesniewski, Donnellan, & Robbins, 2003). In fact, Trzesniewski and colleagues (2003) found that the reliability of self-esteem level was comparable to the reliability of personality traits, such as neuroticism and extraversion.

Theoretically, self-esteem is posited to serve important psychological functions. According to Terror Management Theory (Greenburg, Pyszczynski, & Solomon, 1986; Pyszczynski, Greenberg, Solomon, Arndt, & Schimel, 2004), self-esteem is a buffer that protects individuals from thoughts about their own mortality. In other words, people are motivated to embrace worldviews that make them feel like they contribute to society in a meaningful way (e.g., high self-esteem), which protects against the negative consequences of thoughts about their own death. In support of this theory, individuals with high levels of self-esteem are less affected by reminders of one's mortality than individuals with low self-esteem (Harmon-Jones et al., 1997). From an evolutionary perspective, Sociometer Theory (Leary et al., 1995; Leary & Baumeister, 2000) maintains that self-esteem serves as an indicator of one's fitness for inclusion in social groups, which determines reproductive and survival success. High levels of self-esteem indicate a greater likelihood of social inclusion, whereas low levels of self-esteem indicate a risk of social exclusion. For our ancestors, social exclusion would decrease ability to reproduce and survive. Thus, Sociometer Theory proposes that individuals are motivated to maintain high levels of self-esteem, because positive self-evaluations serve as a gauge for quality of social relationships. In sum, self-esteem is a trait-like personality characteristic theorized to have important psychosocial implications.

There are numerous salutary correlates of self-esteem. Self-esteem level is positively associated with happiness and well-being (DeNeve & Cooper, 1998; Diener & Diener, 2009; Pelham & Swann, 1989). Individuals with higher levels of self-esteem tend to report higher levels of positive affect and lower levels of negative affect (Pelham & Swann, 1989). In one meta-analysis, DeNeve and Cooper (1998) found a moderate, positive association between self-esteem level and subjective well-being ($r = .31$). Diener and Diener (2009) found a large,

positive association between self-esteem and life satisfaction ($r = .51$) in a sample of over 13,000 college student participants across 31 nations. There is also some evidence that self-esteem protects against the development of psychopathology. For example, self-esteem level is associated with less anxiety (Greenburg et al., 1992; Scheier, Carver, & Bridges, 1994), depression (Schroevers, Ranchor, & Sanderman, 2003; Tennen & Herzberger, 1987), hopelessness (Crocker, Luhtanen, Blaine, & Broadnax, 1994), and suicidal ideation (Wilburn & Smith, 2014).

As a result of these findings indicating a link between self-esteem and psychological health benefits, self-esteem has garnered a lot of interest across history in both the field of psychology and popular culture, particularly in North American society. Self-esteem level is a component of numerous psychological theories about human behavior and cognition (e.g., Crocker & Wolfe, 2001; Rodgers, 1959; Tesser, 1988). Self-esteem level has been such an important aspect of theory development that Tafarodi and Swann (2001) claim that the second half of the twentieth century “witnessed the ascension of self-esteem as a central construct in psychological theory” (p. 653). Western cultures tend to hold the view that the enhancement of self-esteem may improve psychological health. As such, several programs and policies have been initiated with the goal of increasing self-esteem in order to address a variety of social and health issues. The most striking example of these is the California Task Force to Promote Self-Esteem and Personal and Social Responsibility (Mecca, Smelser, & Vasoconcellos, 1989). The primary aim of this task force was to implement school programs designed to raise children’s self-esteem level in an attempt to address a range of social issues, such as school underachievement, substance use, and crime. Although many of these programs have been effective at increasing self-esteem level, these changes have not been followed by decreases in the social issues of

concern (Mecca, Smelser, & Vasoconcellos, 1989). Indeed, there is little evidence to support the assertion that boosting self-esteem level is a panacea for social issues or psychological ailments.

There are at least four issues with the literature linking self-esteem level with psychosocial outcomes. First, the magnitude of the associations between self-esteem and many outcomes are smaller than previously believed. In a systematic review of the literature on self-esteem and psychological health, Baumeister, Campbell, Krueger, and Vohs (2003) concluded that most of the identified effects of self-esteem were weak to moderate. The authors noted an exception to this conclusion though: the association between self-esteem and happiness was large. Secondly, Baumeister and colleagues (2003) determined that there is a dearth of evidence supporting the notion that self-esteem is causally related to psychological health. That is, although associations between self-esteem and psychosocial outcomes have been observed, causality cannot be inferred. For example, although self-esteem level is associated with depression, evidence that low levels of self-esteem *cause* depression is inconclusive. Third, there are often contradictory findings regarding self-esteem. For example, some have found a positive association between self-esteem and school achievement (Wylie, 1979), whereas others have found no evidence that self-esteem level enhances achievement (Pottebaum, Keith, & Ehly, 1986). Finally, the possession of high levels of self-esteem can have some negative psychological effects. For instance, high levels of self-esteem are associated with narcissistic traits (Campbell, Rudich, & Sedikides, 2002). Over the past several decades, self-esteem levels of college students have increased (Twenge & Campbell, 2001), but so have levels of narcissism (Twenge, Konrath, Foster, Campbell, & Bushman, 2008). Twenge (2006) also has argued that the cultural emphasis on enhancing self-esteem level has had the unintentional consequences of increasing anxiety and loneliness in younger generations.

Psychological theory and initial correlational evidence indicate that self-esteem is a core element of the human psyche. However, given contradictory and inconsistent findings, it does not appear that self-esteem level alone adequately explains the role of self-esteem in psychological processes. In light of the issues identified in the literature on self-esteem and psychological health, more nuanced conceptualizations of self-esteem have been generated. Rather than merely considering self-esteem level, or the average level of self-worth an individual possess, more intricate aspects of self-esteem have been studied. In particular, self-esteem stability has emerged as an important component of self-esteem.

Self-Esteem Stability

Self-esteem stability refers to “the magnitude of short-term fluctuations that people experience in their contextually based, immediate feelings of self-worth” (Kernis, 2005, p. 4). The traditional conceptualization of self-esteem generally focuses solely on self-esteem level, or a person’s average self-worth. Self-esteem stability, on the other hand, is the extent to which feelings of self-worth fluctuate around one’s average self-esteem level. One’s self esteem level may vary throughout the day due to life experiences or events. For example, one might report particularly high levels of self-esteem after receiving a compliment from a coworker. Or, one may report particularly low levels of self-esteem after receiving a bad grade on an assignment. However, individuals differ in the degree to which self-esteem levels fluctuate across time.

Self-esteem level can be assessed at a single time point using a self-report measure, such as the Rosenberg (1965) Self-Esteem Scale. In contrast, self-esteem stability is assessed by asking participants to report their current evaluations of self-worth over multiple time points. For example, Greenier et al. (1999) asked participants to complete a modified version of the Rosenberg Self-Esteem Scale (RSES-S) at 10:00 AM and 10:00 PM each day for six days. On

this modified version, participants were instructed to respond to the statements considering how they felt about themselves at that particular moment. Self-esteem stability was calculated as the standard deviation of total scores across assessments. Individuals with more variance in self-esteem scores across time are considered to have unstable self-esteem, and individuals with less variance in self-esteem across time are considered to have stable self-esteem. Thus, self-esteem stability is the degree to which immediate feelings of self-worth vary across time.

The stability of self-esteem is thought to reflect an underlying fragility or security in one's sense of self-worth (Kernis, 2005; Paradise & Kernis, 2002). For individuals with unstable self-esteem, fragile feelings of self-worth are believed to be heavily influenced by self-relevant external events (e.g., receiving a bad grade on a test or receiving a compliment) or by self-generated occurrences (e.g., reflecting on an awkward social interaction or reflecting on a presentation a person gave that was well-received by the audience). In contrast, those with stable self-esteem are believed to possess a secure sense of self-worth. Theoretically, those with stable self-esteem have less extreme reactions to self-relevant events.

The notion of self-esteem stability is similar to the concept of unconditional positive regard proposed by Rogers' (1959) theory of personality. Rogers theorized that individuals who experience unconditional positive regard, or praise and approval that is not withdrawn when a mistake is made, are more psychologically healthy and more likely to achieve self-actualization. Unconditional positive regard parallels stable self-esteem in that both concepts refer to self-worth is not dependent or conditional. Conversely, Rogers also theorized conditional self-regard, or praise that is only given under certain circumstances, inhibits psychological growth, weakens one's trust in their own judgments, and increases assurance seeking from others. Conditional

positive regard then might promote unstable self-esteem; that is, self-worth is fragile, conditional, and variable.

It is important to note that self-esteem stability is distinct from self-esteem level (e.g., Kernis, Grannemann, & Barclay, 1989; 1992; Kernis et al., 1998). That is, one can possess stable, high self-esteem or unstable, high self-esteem. Stable, high self-esteem reflects positive, secure feelings of self-worth that are less affected by self-relevant events. Unstable, high self-esteem reflects positive, fragile feelings of self-worth that are more heavily affected by self-relevant events. Similarly, an individual can possess stable, low self-esteem or unstable, low self-esteem. Stable, low self-esteem reflects consistently negative feelings of self-worth, whereas unstable, low self-esteem reflects negative, fragile feelings of self-worth that are heavily influenced by self-relevant events in one's environment.

By considering the stability of self-esteem, new insight is gained on the relation between self-esteem and psychological functioning (e.g., Kernis, Grannemann, & Barclay, 1989; Kernis et al., 1998; Paradise & Kernis, 2000). Growing evidence suggests that more stable self-esteem is associated with psychological benefits and that unstable self-esteem is related to negative outcomes (e.g., Kernis et al., 1998; Paradise & Kernis, 2000). Furthermore, the consideration of self-esteem stability in conjunction with self-esteem level has produced a clearer picture of the relation between self-esteem and several psychological processes (e.g., Kernis, Grannemann, & Barclay, 1989; Kernis et al., 1998; Paradise & Kernis, 2000).

Numerous studies have examined the association between self-esteem stability and depression. In fact, Roberts and Monroe (1994) proposed a multidimensional model of the relation between depression and self-esteem. They argued that those predisposed to depression base their self-worth on fewer sources and that their self-evaluations are more reactive to life

experiences, such as stress. Because of this weak foundation for self-esteem, those at risk for depression tend to have more unstable self-esteem. Indeed, several studies have found an interactive effect of self-esteem stability and stress in the prediction of depression. Specifically, self-esteem stability interacts with frequency of stressful events to predict changes in depression, such that unstable self-esteem in combination with more life stressors predicts increases in depression (Kernis et al., 1998; Roberts & Gotlib, 1997, Roberts & Kassel, 1997; Roberts & Monroe, 1992). Importantly, this significant interactive effect was found even when controlling for self-esteem level (Kernis et al., 1998; Roberts & Gotlib, 1997). These findings support the notion that self-esteem stability is distinct from and has predictive utility that is unique from self-esteem level. Thus, although data demonstrating that self-esteem level predicts onset of depression is lacking (Baumeister et al., 2003; Roberts & Monroe, 1994), theoretical and empirical data support the view that unstable self-esteem in combination with the presence of life stress prospectively predicts depression.

The finding that unstable self-esteem in stressful environments predicts depression suggests that individuals with more unstable self-esteem are more affected by daily stressors. To test this idea, Greenier and colleagues (1999) examined whether individuals with unstable self-esteem are more reactive to daily events. Participants recorded the most positive and negative events of their day, as well as the extent to which these events changed feelings of self-worth each day, for two weeks. Individuals with unstable self-esteem displayed a heightened reactivity to daily events. That is, individuals with unstable self-esteem reported that they felt significantly better about themselves following positive events than did individuals with stable self-esteem. Conversely, individuals with unstable self-esteem also reported that they felt significantly worse about themselves following a negative event than did individuals with stable self-esteem. This

effect was found even when controlling for self-esteem level. In other words, regardless of self-esteem level, those with unstable self-esteem experience more drastic changes in self-worth following both positive and negative daily events.

Just as the relation between self-esteem and depression can be clarified by considering self-esteem stability, so too can the relation between self-esteem and anger. If one considers only self-esteem level, evidence regarding the relation between self-esteem level and anger proneness is mixed. Some work suggests that high self-esteem is associated with less anger (Rosenbaum & DeCharms, 1960), but other research suggests that high self-esteem level is related to more anger (Worchel, 1958). Kernis, Grannemann, and Barclay (1989) attempted to resolve these mixed findings by considering self-esteem stability. Participants completed several measures of anger and hostility, a measure of self-esteem level, and daily measures of state self-esteem to construct an index of self-esteem stability. Across a majority of the anger and hostility measures, significant self-esteem level by self-esteem stability interactions emerged. In general, individuals with high, unstable self-esteem were the most prone to anger and hostility, and individuals with high, stable self-esteem were the least prone to anger and hostility. Similarly, Kernis, Greenier, Herlocker, Whisenhunt, and Abend (1997) found a significant self-esteem level by self-esteem stability interaction in the prediction of defensive reactions to a negative evaluation. More specifically, individuals with high, unstable self-esteem were more likely to report that they would be angry at the person who devised the task and to blame factors that were beyond their control than individuals with high, stable self-esteem. In sum, high self-esteem level predicts more anger proneness, but only when self-esteem is unstable. Individuals with high, unstable self-esteem possess positive, but fragile self-views, so they are particularly sensitive to ego

threats. Thus, when receiving a negative evaluation, individuals with high, unstable self-esteem may be more likely to respond with anger or defensive behaviors.

Other evidence also links unstable self-esteem with defensive behaviors. Waschull and Kernis (1996) assessed the relations among self-esteem level, self-esteem stability, and intrinsic motivation in a sample of fifth grade students. Self-esteem stability was associated with curiosity and preference for challenge, even while controlling for self-esteem level. That is, students with unstable self-esteem reported less curiosity and less preference for challenge, regardless of self-esteem level. The authors concluded that students with unstable self-esteem tend to possess a learning style characterized by self-esteem protection rather a learning style directed towards intellectual growth.

Baumeister and colleagues (2003) concluded that the relation between self-esteem and higher levels of well-being is one of the most well-documented correlates of self-esteem, but even this association can be clarified by considering self-esteem stability. In a sample of undergraduates, Paradise and Kernis (2000) assessed self-esteem level, self-esteem stability, and psychological well-being. Psychological well-being was measured via Ryff and Keyes's (1995) Psychological Well-Being Measure, which contains six subscales: autonomy, environmental mastery, purpose in life, self-acceptance, positive relationships with others, and personal growth. Self-esteem level was significantly associated with all of the well-being subscales, such that higher level of self-esteem correlated with higher levels of well-being. Self-esteem stability was significantly associated with autonomy, environmental mastery, and purpose in life, such that more stability was correlated with high levels of well-being in these domains. However, significant self-esteem level by self-esteem stability interactions emerged in the prediction of self-acceptance and positive relations. More specifically, for those with high levels of self-

esteem (but not for those with low levels of self-esteem) unstable self-esteem predicted lower levels of self-acceptance and less positive personal relations. As with the other studies reviewed above, more nuanced insight concerning the correlates of self-esteem is gained by considering the role of self-esteem stability.

Although the above evidence generally indicates that more stable self-esteem is associated with higher levels of psychological well-being, it is also important to consider that stable self-esteem may be detrimental in some contexts. For example, it could be reasonably argued that individuals with depression might possess self-esteem that is low and stable (Farmer & Kashdan, 2014). To date, no study has measured self-esteem stability in samples of individuals with chronic or recurrent depression, but it is reasonable to expect that these populations may possess low, stable self-esteem. Additionally, given the theoretical accounts of self-esteem (e.g., Sociometer Theory and Terror Management Theory), self-esteem that is too stable may not allow for the proposed theoretical benefits of self-esteem. For example, with regard to Sociometer Theory, if an individual does not experience meaningful fluctuations in self-esteem, that person may not have an indication of their social inclusion. So, there may be some negative consequences of self-esteem that is too stable in some contexts, but on the whole self-esteem stability is associated with salutary psychology effects.

Given the psychological health benefits of stable self-esteem, as well as the insight gained when considering stable self-esteem, it is important to identify constructs that may potentially increase stability of self-esteem. Although research identifying the factors that predict stability is relatively sparse, initial data have provided some insight as to some factors that may determine one's self-esteem stability. Developmentally, particularly harsh childhood environments may predispose one to unstable self-esteem. Kernis, Brown, and Brody (2000)

found that 11- to 12- year old children with more unstable self-esteem tended to report that their fathers were more critical in their communication and were less likely to acknowledge positive behaviors. A relatively weak sense of self may also contribute to more unstable self-esteem. One study found that self-esteem stability is associated with higher levels of self-concept clarity, controlling for self-esteem level (Kernis, Paradise, Whitaker, Wheatman, & Goldman, 2000). In this study, self-concept clarity was defined as the extent to which one's perceived personal attributes are well-defined, consistent, and stable. In other words, even when controlling for the effects of self-esteem level, self-esteem stability is related to more clearly defined and confidently held self-concept.

Furthermore, some have theorized that individuals with unstable self-esteem tend to possess a certain kind of cognitive set comprised of three interlocking components (Greenier et al., 1999; Kernis, 2005). The first component is an *attentional pattern* whereby one's attention is particularly sensitive to events or information that may have self-evaluative implications. The second component is a *bias* whereby ambiguous or non-self-esteem relevant events or information is interpreted as being self-esteem relevant. The third component is a tendency to *generalize* one's sense of self-worth to events or information that have self-relevant implications. In other words, it is theorized that those with unstable self-esteem relative to those with stable self-esteem tend to more intimately link their feelings of self-worth with the experiences they have on a given day. Therefore, if one were able to disengage feelings of self-worth from evaluative experiences, one could theoretically enhance stability of self-esteem and in turn experience the salutary outcomes associated with stable self-esteem. As mindfulness encourages a nonjudgmental orientation to one's experiences whereby thoughts, feelings, and reactions are

viewed as transient events that do not necessarily reflect truth, mindfulness presents one potential way to enhance the stability of self-esteem.

Mindfulness

Grounded in ancient Buddhist practices, mindfulness involves “paying attention in a particular way; on purpose, in the present moment, and non-judgmentally” (Kabat-Zinn, 1994; p. 4). Mindfulness involves two key components: present-focused attention and a nonjudgmental attitude towards one’s experiences (Bishop et al., 2006). That is, mindfulness involves actively directing one’s attention to the present moment. This present-focused attention stands in contrast to other attentional processes. For example, rumination is a past-focused attentional process which involves repeatedly directing one’s attention to the causes of one’s emotional distress (Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008). Worry, a future-oriented attentional process, involves a focus on uncertain, future events (Borkovec, Ray, & Stober, 1994), which also stands in contrast to mindfulness. Mindfulness is a sustained, receptive attention to and awareness of internal and external experiences as they occur (Brown & Ryan, 2003).

In addition to present-focused attention, mindfulness also involves a nonjudgmental, accepting, and curious perspective towards experiences that presently occur. This nonjudgmental perspective towards one’s experiences is a critical component of mindfulness and is found across various definitions and conceptualizations of mindfulness. This perspective has been referred to as decentering (Fresco et al., 2007), re-perceiving (Shapiro et al., 2006), and defusion (Hayes, 2004; Hayes et al., 2006). This nonjudgmental component of mindfulness encourages one to view thoughts, feelings, and reactions as transient, subjective events rather than reflections of objective reality or reflections of the self (Teasdale, 1999; Teasdale et al., 2000). In this view, experiences and events are seen as passing events that do not necessarily represent objective

reality. This nonjudgmental perspective is thought to play an important role in explaining the therapeutic benefits of mindfulness. It is theorized that by attending to the present moment in this non-evaluative manner, thoughts and sensations are noticed rather than being elaborated upon or avoided (e.g., Bishop et al., 2006; Frewen et al., 2008).

Mindfulness has been examined as both a state of being as well as a dispositional trait (Baer et al., 2006; Brown & Ryan, 2003). Bishop and colleagues (2006) argue that state mindfulness occurs when one intentionally directs attention to present moment experiences with a nonjudgmental perspective. State mindfulness can be elicited in practices, such as mindfulness meditation, in which participants focus their attention on thoughts, emotions, and bodily sensations as they come and go (Bishop et al., 2006; Hozel et al., 2011). One of the most common practices designed to elicit state mindfulness is a guided breathing exercise (e.g., Arch & Craske, 2006). In this exercise, individuals are instructed to focus their attention to the sensation of breathing and to softly redirect their attention back to their breath when they find that their mind has wandered. In this exercise, distracting and random thoughts are viewed simply as transitory. By intentionally attending to the feeling of breathing with this particular practice, state mindfulness can be garnered.

Mindfulness has also been studied as a relatively stable individual difference. Trait mindfulness refers to a person's tendency to engage in state mindfulness in daily life without participating in specific practices, such as guided breathing exercises (Brown & Ryan, 2003). That is, some individuals actively attend to present moment experiences with a nonjudgmental perspective towards those experience more often than others. Absent of intervention, an individual's level of trait mindfulness is relatively stable across time (e.g., Barnes, Brown, Krusemark, Campbell, & Rogge, 2007; Brown & Ryan, 2003). Indeed, numerous self-report

measures have been developed to assess trait mindfulness levels (e.g., Mindful Attention Awareness Scale, Brown & Ryan, 2003; Five Facet Mindfulness Questionnaire, Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006).

Mindfulness-based interventions are presumed to increase levels of trait mindfulness. These mindfulness-based interventions generally span eight weeks and involve the regular practice of exercises designed to induce states of mindfulness, such as focused breathing exercises. Mounting evidence demonstrates that mindfulness-based interventions increase levels of trait mindfulness (e.g., Carmody, Reed, Kristeller & Merriam, 2008; Shapiro, Oman, Thoresen, Plante, & Flinders, 2008). It is believed that by routinely fostering state mindfulness, one's propensity towards state mindfulness in daily life is increased. Indeed, Kiken, Garland, Bluth, Palsson, and Gaylord (2015) found that greater rates of increase in state mindfulness during mindfulness meditations in a mindfulness-based intervention predicted higher levels of trait mindfulness at post-intervention. Although these mindfulness-based interventions are usually led by a trained mindfulness instructor, a recent meta-analysis also demonstrated that trait mindfulness can be increased following guided, self-help interventions (Cavanagh, Strauss, Forder, & Jones, 2014). Thus, regular engagement in state mindfulness practices can lead to greater trait mindfulness.

Mindfulness is related to a range of psychological health benefits (e.g., Brown, Ryan, & Creswell, 2007; Keng, Smoski, & Robbins, 2011). To name just a few salutary correlates, trait mindfulness is associated with higher levels of subjective well-being, self-actualization, and optimism (Brown & Ryan, 2003; Goldin & Gross, 2010; Kiken & Shook, 2012). It is also associated with lower levels of cognitive reactivity to dysphoric moods, rumination, and pessimism (Gu, Strauss, Bond, & Cavanagh, 2015; Kiken & Shook, 2012; Raes, Dewulf, Van

Heeringen, & Williams, 2009). Mindfulness is associated with health-related personality traits, such as less neuroticism and higher levels of conscientiousness (Giluk, 2009). A growing body of evidence demonstrates the negative association between mindfulness and emotional distress. Numerous studies have shown that individuals higher in trait mindfulness tend to endorse fewer symptoms of depression and anxiety (e.g., Barnhofer, Duggan, Griffith, 2011; Brown et al., 2007; Coffey, Hartman, & Fredrickson, 2010; Desrosiers et al., 2013). Moreover, mindfulness based interventions are efficacious in reducing depression and anxiety (Hofman, Sawyer, Witt, & Oh, 2010; Vollestad, Nielsen, & Nielsen, 2012).

Given that mindfulness is related to many positive psychological outcomes, research has examined whether mindfulness relates to self-esteem. Randal, Prat, and Bucci (2015) conducted a systematic review of the relation between mindfulness and self-esteem level. Across fifteen studies, they found moderate associations between trait mindfulness and self-esteem level. That is, individuals higher in trait mindfulness reported higher levels of self-esteem. Evidence that mindfulness-based interventions improve self-esteem level is more mixed. Of seventeen studies reviewed, eleven found that self-esteem level increased following a mindfulness-based intervention. The other six studies reviewed found no change in self-esteem level following a mindfulness-based intervention. Similarly, evidence that state mindfulness inductions increase state self-esteem level is also inconsistent, although only two studies on this topic were reviewed. Whereas one study found that state self-esteem improved following a state mindfulness exercise (Pepping et al., 2013), another study did not replicate this finding (Koole et al., 2009). Therefore, trait mindfulness appears to be associated with high levels of self-esteem level. However, there is mixed evidence whether the relation between mindfulness and self-esteem level is causal.

There seems to be a modest association between mindfulness and self-esteem level. However, to date, no published research has assessed the association between mindfulness and self-esteem stability. Theoretical and initial evidence suggest that mindfulness may relate to and cause more stability in self-esteem, but this association has not yet been explored. Furthermore, by considering self-esteem stability, additional clarity about the relation between mindfulness and self-esteem could be acquired.

Mindfulness and Self-Esteem Stability

Some have theorized that unstable self-esteem stems from a cognitive set characterized by an attention pattern that is sensitive to events that have self-evaluative implications, a tendency to interpret ambiguous events as having self-evaluative implications, and a tendency to generalize one's sense of self-worth to events or information that have self-relevant implications (Greenier et al., 1999; Kernis, 2005). In other words, individuals with unstable self-esteem relative to those with stable self-esteem tend to more intimately link their feelings of self-worth and daily experiences. Because mindfulness encourages a nonjudgmental orientation to one's experiences, mindfulness may weaken the link between self-evaluations and daily experiences. In other words, because thoughts, feelings, and reactions are viewed as transient events that do not necessarily reflect objective reality, mindfulness may present one potential way to enhance the stability of self-esteem.

Mindfulness encourages one to view thoughts and feelings as temporary events rather than reflections of reality or aspects of the self (Teasdale, 1999; Teasdale et al., 2000). Teasdale (1999) argued that state mindfulness activates a metacognitive insight mode of the mind, which allows an individual to experience thoughts simply as events in the mind rather than depictions of reality. Theoretically, by relating to experiences in this nonjudgmental manner, negative and

positive experiences are viewed merely as passing events that may not reflect reality rather than being elaborated upon. Perhaps then, due to this decentered orientation, highly mindful individuals are less likely to alter their assessments of self-worth based on the thoughts, feelings, or experiences in their immediate, daily environments. If this reasoning is accurate, then highly mindful individuals would display less extreme reactions to positive and negative events; that is, mindful individuals would display less variability in their reactions to daily experiences. In sum, because mindfulness fosters a nonjudgmental orientation towards experiences, highly mindful individuals may better differentiate feelings of self-worth and reactions to daily events, which might result in more stable self-esteem.

In support of this theoretical view, mindfulness is associated with reduced reactivity to stressful events. Two studies found that higher levels of trait mindfulness predicted smaller changes in negative affect and anxiety following stressful experiences (Arch & Craske, 2010; Brown, Weinstein, & Creswell, 2012). Furthermore, Brown and colleagues (2012) observed that highly mindful individuals tended to display a more diminished biological stress response (e.g., lower levels of cortisol) following a stress induction procedure. The association between mindfulness and less reactivity in the face of stress appears to be causal. Compared to groups induced with worry or unfocused attention, participants induced with mindfulness via a focused breathing exercise reported lower levels of negative affect after viewing negative images (Arch & Craske, 2006). Similarly, a brief mindfulness meditation intervention reduced self-reported anxiety during a social stress task (Creswell, Pacilio, Lindsay, & Brown, 2014). Thus, mindfulness may reduce stress reactivity, which may promote more stable self-esteem.

Of particular relevance to this study, Hill and Updegraff (2012) explored whether mindfulness was related to stability of affective experiences in daily life. In this study, the

researchers assessed trait mindfulness in a sample of undergraduate participants. Then, for the next week, participants reported their current emotional experiences six times per day. More specifically, participants indicated the extent to which they were experiencing a list of positive and negative affective states. Trait mindfulness was associated with more stability of both positive and negative affective states. In other words, highly mindful individuals reported less variability in their positive and negative affective states over the course of one week.

Mindfulness then may promote more stable self-esteem by promoting more stability in affective experiences.

Work on self-concept clarity also suggests that mindfulness and self-esteem stability may be related. It has been proposed that individuals with unstable self-esteem tend to possess less clearly defined and less confidently held self-concepts (Kernis, Paradise, Whitaker, Wheatman, & Goldman, 2000). According to this proposition, the enhancement of self-concept clarity could promote more stability in self-esteem. Interestingly, Hanley and Garland (2017) found that higher levels of trait mindfulness were positively correlated with self-concept clarity. That is, more mindful individuals tended to have more clearly defined and more confidently held views of the self. Although the cross-sectional nature of the study prohibits causal claims about the relation between mindfulness and self-concept clarity, this study provides some initial support to the view that mindfulness might enhance self-concept clarity, which in turn may increase the stability of self-esteem.

More direct evidence for the relation between mindfulness and self-esteem stability also exists. Unpublished, preliminary data indicate a significant relation between trait mindfulness and self-esteem stability (Ford & Shook, 2017; Heppner & Kernis, 2007). Utilizing the Rosenberg Stability of Self Scale (Rosenberg, 1965), a five item, unidimensional self-report

measure designed to assess day-to-day fluctuations in self-esteem level, Ford and Shook (2017) found a medium-sized correlation between trait mindfulness and self-esteem stability, $r(261) = .42, p < .001$. That is, individuals high in trait mindfulness tended to endorse more stable self-esteem. Despite these promising findings, a one-time self-report is not the gold standard assessment method of self-esteem stability. However, Heppner and Kernis (2007) cite an unpublished study that assessed self-esteem stability over a period of time. They also found a significant, positive correlation between the trait mindfulness and self-esteem stability, $r = .26, p < .01$. Together these findings provide support for the link between mindfulness and self-esteem stability. However, the correlational nature of these unpublished studies prohibits causal claims from being made.

In sum, theoretical accounts of mindfulness support a relation between mindfulness and more stable self-esteem. Furthermore, it can be reasoned that mindfulness may promote more stable self-esteem, because mindfulness is associated with less reactivity to experiences and more self-concept clarity. Perhaps most convincingly, unpublished data describe a positive correlation between trait mindfulness and stable self-esteem. Based on these findings, mindfulness seems to be related to stable self-esteem. However, neither of these studies controlled for potential third variables or tested the causal link between mindfulness and self-esteem stability. So, it remains possible that mindfulness and self-esteem stability are correlated due to shared variance with an unmeasured third variables. Furthermore, that precise nature of the relation between mindfulness and self-esteem stability is unclear. That is, to the author's knowledge, no study has examined whether the association between mindfulness and self-esteem is causal. In other words, it is not known whether increasing levels of mindfulness through training causes more stable self-esteem.

Proposed Research

The primary purpose of the present research was to examine the association between mindfulness and self-esteem stability. To address this goal, one study was conducted with two aims. The first aim was to determine the extent to which trait mindfulness was associated with self-esteem stability. The second aim was to experimentally test whether engaging in regular mindfulness practice increased stability in self-esteem. Participants were randomly assigned to a mindfulness training intervention, an active control intervention, or a null control condition in which no intervention was delivered. Overall, it was expected that higher levels of mindfulness would be related to more stable self-esteem. For Aim 1, it was hypothesized that higher levels of trait mindfulness would be significantly associated with more stable self-esteem. Participants in the null control group received no intervention and comprised the sample used to address Aim 1. For Aim 2, it was expected that participants would report more stable self-esteem in the mindfulness training intervention than the active control or null control group. To address Aim 2, participants in all three conditions were included in data analysis.

Method

Participants

Undergraduate students at West Virginia University were recruited from the Department of Psychology's subject pool. To conceal the true purpose of study, participants were told that they were participating in a study examining the effectiveness of two mobile phone apps. To participate, students had to be 18 years or older and fluent English speakers, because validation studies of the measures utilized in this study were on adult, English-speaking samples. Additionally, individuals who did not possess a mobile smartphone were ineligible to participate,

because a smartphone was required to participate in the procedure for assessing self-esteem stability.

For Aim 1, an a priori power analysis was conducted using the computer program “G Power” version 3.1 (Faul, Erdfelder, Buchner, & Lang, 2009) and revealed a necessary sample size of 81 to detect a medium effect size ($f^2 = .10$) with $\alpha = .05$ and power = .80. This power analysis was conducted for a linear multiple regression with five total predictors. For Aim 2, a separate a priori power analysis was conducted for a two by three mixed model ANCOVA with three groups. This power analysis revealed a necessary sample size of 144 (or 48 per group) to detect a medium effect size ($f^2 = .20$) with $\alpha = .05$ and power = .80. For both power analyses, a medium-sized effect was anticipated based on Hepper and Kernis (2007) and pilot data from our lab (Ford & Shook, 2017). A total of 300 participants were recruited for the study (77.9% female; $M_{\text{age}} = 19.58$ years, $SD = 2.94$, range: 18-55 years; 83.1% white). Using weighted random assignment based on required sample sizes from the a priori power analyses, participants were randomly assigned to the mindfulness training intervention, the cognitive training intervention, or the null control condition using a random number generator in Microsoft Excel. More participants were recruited for the null control condition than the cognitive training and the mindfulness training condition in order to achieve sufficient power to address Aim 1. After random assignment, there were 145 participants in the null control group, 77 participants in the cognitive training (active control) group, and 78 in the mindfulness training (experimental) group.

A total of 110 participants were excluded from the analyses for several different reasons. Twenty-one participants (six in the null control, seven in the active control, and eight in the experimental condition) did not return to complete the second in-lab session. Consistent with

previous research (e.g., Greenier et al., 1999; Kernis, Grannemann, & Mathis, 1991), only participants who completed at least 75% of the modified, state version of the Rosenberg Self-Esteem Scale (RSES-L) daily assessments were retained for data analysis. Using this criterion excluded 60 additional participants: 25 from the null control condition, 21 from the active control condition, and 14 from the experimental condition. Data were also examined for missingness and outliers. Data from reported daily hassles and uplifts were missing from 18 participants (eleven in the null control, two in the active control, and five in the experimental condition). Eleven participants were excluded from data analysis due to outlying scores and/or errant responding¹. Specifically, one participant was excluded due having no variability in self-esteem, one participant was excluded due to possessing an abnormally high self-esteem stability score (e.g., $z > 3.2$), two participants was removed for reporting abnormally high hassles (e.g., $z > 3.2$), and seven participants were excluded for reporting no variability in either positive or negative mood. Participants who were excluded from data analysis were more likely to be non-white, $X^2(1, N = 300) = 7.10, p = .01$, than participants who were retained for data analyses. Participants excluded from data analysis did not differ from participants who were retained for data analyses on any of the primary variables ($ps > .11$). To explore whether there was differential attrition/exclusion between conditions, a chi square test of independence was performed. The chi square test indicated no relation between exclusion from the final analyses and condition, $X^2(2, N = 300) = 1.81, p = .41$, which suggest that there was no differential attrition/exclusion between conditions.

¹ Data analysis was also conducted with these 11 outliers included. The overall pattern of results was generally similar with these 11 outliers included. The results with these outliers included were similar to the results with the outliers excluded in Aim 1 and Aim 2 with one exception: in the null control condition, FFMQ-describe was significantly related to SE stability when outliers were included, $r(101) = -.23, p = .02$.

The final sample consisted of 190 participants (83.7% female; $M_{\text{age}} = 19.59$ years, $SD = 2.50$, range: 18-48 years). There were 96 participants in the null control condition, 44 participants in the cognitive training control condition, and 50 participants in the mindfulness training condition. Across conditions, participants were 89.5% Caucasian/White, 6.3% African-American/Black, 3.7% Asian, 5.8% Hispanic, 1.1% Native American, and 4.2% identified as “other.” (See Table 1 for demographics split by condition.) Several participants self-reported some previous engagement with mindfulness-related activities: 16.3% reported they had previously meditated regularly, 23.2% reported they had previously practiced yoga regularly, and 1.1% reported they had previously practiced tai chi regularly. Participants with previous meditation experience reported higher levels of FFMQ-observing than participants without previous meditation experience, $t(188) = 2.65, p = .01$. However, there were no other differences in trait mindfulness between participants with previous mindfulness-related activity experience and participants without such experiences ($ps > .09$). As such, mindfulness-related practice was not included as a covariate in the primary analyses.

Measures and Materials

Mindful Attention Awareness Scale (MAAS; Brown & Ryan 2003). The MAAS is a 15-item scale that measures awareness of present moment experience in one’s daily life. It is a unidimensional measure of dispositional mindfulness. Participants indicated how frequently they have had each experience (e.g., “I do jobs or tasks automatically, without being aware of what I’m doing.”) on a scale from 1 (“almost always”) to 6 (“almost never”). All items are summed to compute a total scale. Higher total scores indicate higher levels of trait mindfulness. In previous studies, the MAAS has demonstrated adequate internal consistency ($\alpha s = .80 - .87$; Brown & Ryan, 2003). There is also evidence of convergent validity for the MAAS in previous studies.

The MAAS is positively associated with openness to experience ($r = .18$), internal state awareness ($r = .23$), and need for cognition ($r = .19$; Brown & Ryan 2003). It is also negatively associated with depression ($r = -.41$), trait anxiety ($r = -.40$), and rumination ($r = .23$; Brown & Ryan, 2003). In the present study, the MAAS demonstrated adequate internal consistency ($\alpha = .85$).

Five-Facet Mindfulness Questionnaire (FFMQ, Baer et al., 2006). This 39-item scale measures trait mindfulness. It consists of five subscales: nonreactivity, observing, acting with awareness, describing, and nonjudging. Participants indicated the degree to which each statement (e.g., “I find myself doing things without paying attention.”) is true in their lives on a scale from 1 (“rarely” or “never true”) to 5 (“very often” or “always true”). Appropriate items were reverse scored, and then items on each subscale are summed to compute a total subscale score. High scores on each total subscale score indicate higher levels of trait mindfulness. There is evidence of convergent validity with the FFMQ from previous research. For example, all of the subscales were positively related to psychological well-being, and all but one was associated with meditation experience (Baer et al., 2008). In the present study, all subscales demonstrated evidence of adequate internal consistency: nonreactivity ($\alpha = .72$), observing ($\alpha = .78$), acting with awareness ($\alpha = .87$), describing ($\alpha = .90$), and nonjudging ($\alpha = .89$).

Self-Esteem Level (Rosenberg, 1965). Self-esteem level was assessed with the Rosenberg Self-Esteem Scale (RSES-L). The RSES-L is a 10-item, unidimensional measure of global self-esteem level. Participants rated the degree to which they agree with a number of statements (e.g. “I feel that I have a number of good qualities.”) on a four-point scale from “strongly agree” to “strongly disagree.” There were no numerical values associated with each response option. Participants were instructed to think about how they generally feel about

themselves when completing the measure. Appropriate items are reverse-coded and items are averaged to create a total score, such that higher scores indicate higher self-esteem levels. The RSES-L demonstrates adequate internal consistency in previous studies ($\alpha = .80 - .87$; Gray-Little, Williams, & Hancock, 1997). The RSES-L possesses evidence of convergent validity. For example, the RSES-L is positively associated with extraversion, agreeableness, optimism, life satisfaction, and dispositional positive affect (Robins, Hendin, & Trzesniewski, 2008). In the present study, the RSES-L demonstrated evidence of adequate internal consistency ($\alpha = .79$).

Self-Esteem Instability. To assess self-esteem instability, participants were asked to complete a modified version of the Rosenberg Self-Esteem Scale (RSES-L) at 10:00 AM and 10:00 PM each day for 10 days (e.g., Greenier et al., 1999; Kernis, Cornell, Sun, Berry, & Harlow, 1993; Kernis, Granneman, & Barclay, 1989; Kernis, Greenier, Herlocker, Whisenhunt, & Abend, 1997). The items on the modified, state version of the RSES-L were identical to items on the original RSES-L. However, the modified version possessed a different set of instructions and a different response format. On this modified version, participants were instructed to respond to the statements considering how they feel about themselves at that particular moment. By instructing participants to respond to how they feel at that particular moment, this measure became an assessment of state self-esteem. Also, response anchors of “Strongly agree” to “Strongly disagree” were separated by eight unlabeled response options, and participants were asked to indicate the response that best represents their level of agreement. The difference in response format was used so participants could more readily distinguish the measure of trait self-esteem (e.g., RSES-L) and this modified, state measure of self-esteem. State self-esteem scores were calculated for each assessment. Appropriate items were reverse-coded and items were averaged. Self-esteem instability was calculated as the standard deviation of state self-esteem

scores across assessments. Higher scores indicated more unstable self-esteem, and lower scores indicated more stable self-esteem.

Mood Questionnaire (MQ; Mata, Hogan, Joorman, Waugh, & Gibb, 2013). The mood questionnaire was used to measure mood variability, which served as a covariate. Using a 7-point Likert-type scale from 1 (*not at all*) to 7 (*very*), participants responded to two questions: “How positive are you feeling right now?” and “How negative are you feeling right now?” Responses to the two items served as indicators of state positive affect and state negative affect, respectively. Participants were asked to report their affect each time they completed the modified, state measure of self-esteem. Thus, participants completed the mood questionnaire at 10:00 AM and 10:00 PM each day for 10 days. An index of positive mood variability was calculated as the standard deviation of the positive mood items across assessments. An index of negative mood variability was calculated as the standard deviation of the negative mood items across assessments. Higher scores on these indices indicated more mood variability and lower scores more stability.

Hassles and Uplifts Scale (HUS; DeLongis, Folkman, & Lazarus, 1988). The HUS was used to measure the number of stressful events and the severity of those stressful events as well as the number of uplifting event and the severity of those uplifting events that participants experienced over the 10-day period in which self-esteem stability was assessed. The scale consists of 52 potential life areas (e.g., health, workload, news events, etc.). Participants rated how much of a hassle each item was on a scale from 0 (“None”) to 3 (“a great deal”). Items were summed to create a total hassles score, such that higher scores indicated more hassles experienced. Participants also rated how much of an uplift each item was on a scale from 0

(“None) to 3 (“a great deal”). Items were summed to create a total uplifts score, such that higher scores indicated more uplifts experienced.

Demographic Questionnaire. Participants were asked about common demographic variables, including age, gender, college rank, sexual orientation, political orientation, marital status, ethnicity/race, socioeconomic status, and psychology courses taken. Participants were also asked about their experiences with mindfulness-related activities, such as yoga, tai chi, or meditation.

Toronto Mindfulness Scale (TMS; Lau et al., 2006). The TMS is a 13-item scale that measures state mindfulness. The TMS was designed to be completed immediately following a mindfulness exercise to assess the level of state mindfulness garnered during the exercise. It consists of two subscales: curiosity and decentering. Participants indicated how well each item describes what they just experienced (e.g., “I experienced my thoughts more as events in my mind than as a necessarily accurate reflection of the way things ‘really’ are.”) on a scale from 0 (“not at all”) to 4 (“very much”). All items on each subscale were summed to compute a total score. Higher total scores indicate higher levels of state mindfulness. State mindfulness was measured as a manipulation check (i.e., in order to determine whether the exercises performed in the interventions impacted state mindfulness). Previous research indicates that the TMS demonstrates adequate internal consistency: curiosity ($\alpha = .88$) and decentering ($\alpha = .84$; Lau et al., 2006). The TMS possesses evidence of convergent validity and criterion validity. Both TMS subscales are positively correlated with awareness of surroundings and reflective self-awareness (Lau et al., 2006). Furthermore, both TMS subscales significantly increased following participation in an eight-week mindfulness based intervention (Lau et al., 2006). In the present

study, both the decentering (α s range = .73 - .92) and curiosity (α s range = .85 - .94) subscales demonstrated evidence of internal consistency.

Exercise Log. Participants in the experimental and active control conditions were asked to keep a log of the date and time that they completed the exercises to which they were assigned. That is, individuals in the mindfulness practice group recorded the times that they completed the mindfulness exercises, and individuals in the cognitive training group recorded the times that they completed the cognitive training exercises. In addition to the days and times that they completed their respective exercises, participants were instructed to write a brief, one to two sentence reaction to the exercise. More specifically, participants were encouraged to note things that they enjoyed or did not enjoy about the exercise, whether the exercise was easy or difficult, or how they felt before, during, or after the exercise. The purpose of the exercise log was to increase the likelihood that participants completed the daily exercises.

Mindfulness Training Intervention. The mindfulness training intervention consisted of a 10-day program via the app called Headspace (<https://www.headspace.com>, Santa Monica, CA, USA). Headspace offers a free, 10-day program called “Basics.” To access the free material, users subscribe to the app by providing a functional email address. Headspace consists of one introductory animated video, four instructional animated videos, and 10 guided mindfulness meditation exercises. The app is designed such that one of the 10 guided mindfulness meditation exercises is to be completed each day for ten days.

On Day 1, participants view the introductory animated video prior to the mindfulness meditation exercises. Participants then view the other four instructional videos prior to the mindfulness meditation exercise on Day 3, Day 5, Day 7, and Day 9. Each of the animated instructional videos are between 60 and 90 seconds long. The introductory animation encourages

participants to conduct the exercises in the mornings at roughly the same time each day while sitting in a chair with an upright posture in a quiet space, and informs participants that the exercises may be more difficult on some days than on other days. The other instructional animated videos teach participants about the concept of decentering through metaphors. For example, on Day 3, participants are encouraged to view thoughts as though they are cars on a highway. In everyday lives, people tend to try and chase the cars. However, in mindfulness meditation, the animation instructs participants to try and observe the cars pass from the side of the highway; that is, the app encourages participants to view thoughts as passing events without becoming too attached to any one particular thought.

The mindfulness meditation exercises are very similar across days. The general format of the exercise consists of a brief body scan, focused breathing, and a time to let one's thoughts wander freely and to view those thoughts as an observer. The app offers 3 min, 5 min, and 10 minute versions of the mindfulness meditation exercises. Participants in this study were instructed to complete the 10 minute exercises. The app also possesses a setting that provides daily reminders to complete the exercises at a time designated by the user. Participants were instructed to use this reminder feature. Headspace logs the number of exercises completed as well as the total time spent engaged in the exercises and the average duration of each exercise.

Cognitive Training Intervention. To serve as an active control condition, a cognitive training intervention was utilized. This cognitive training intervention was delivered via the Peak (www.peak.net, London, England) mobile app. Peak offers a free trial in which participants are given access to four games/puzzles per day. In this free trial, participants are only permitted to play each game/puzzle one time. Each of the games/puzzles are timed, and it takes about 10 minutes to complete them. The app has a feature in which daily reminders arrive on users'

phones reminding them to complete their daily games/puzzles. The free trial of Peak provides users with a random selection of games and puzzles, so users experience unique games each day. These games and puzzles are intended to test and improve performance in cognitive domains, such as memory, attention, problem solving, verbal fluency, and processing speed. The app claims that by engaging in these exercises daily, one can improve mental performance.

Previous studies examining the effectiveness of mindfulness based training programs delivered via smartphone apps have also used cognitive training interventions as active control conditions (e.g., Bennike, Wieghorst, & Kirk, 2017). Cognitive training interventions are useful control interventions because they require similar cognitive demands (e.g., focused attention) to mindfulness training interventions, but offer no explicit mindfulness training. The Peak app was specifically chosen as the active control training condition as the structure of its free program was very similar to the structure of the Headspace app's free program. Both training programs involved participation in daily exercises that lasted about 10 minutes, restricted access to exercises beyond the allotted 10 minutes, and were designed to be used daily.

Procedure

Undergraduate students at West Virginia University were recruited from the Department of Psychology's subject pool. To conceal the true purpose of study, participants were told that they were participating in a study examining the effectiveness of two mobile apps. The study involved participation in two in-lab study sessions, separated by approximately 10 days, and completion of two surveys per day for 10 days in between the in-lab study sessions. Participants were randomly assigned to one of three experimental conditions in the first study session: null control, cognitive training (active control), and mindfulness training.

In the first study session, upon entering the lab, participants were greeted by an experimenter and seated at an individual workstation. The experimenter provided participants with a brief overview of the study. Participants were asked to read and sign informed consent forms. Then, participants completed the following measures in the following order: MAAS, FFMQ, RSES-L, and demographic questionnaire (All measures can be found in Appendix A). Using a weighted random assignment based on required sample sizes from the a priori power analyses, participants were randomly assigned to the mindfulness practice intervention, the cognitive training intervention, or the null control condition using a random number generator in Microsoft Excel. For those in the mindfulness practice or cognitive training intervention conditions, research assistants then instructed participants to download the appropriate app onto their smartphones. Next, participants were instructed to engage in either Day 1 of the mindfulness training app or Day 1 of the cognitive training app. Following participants' first exercise, research assistants demonstrated to participants how to set up daily reminders to complete the exercises on their phones. Participants were instructed to complete their daily exercises at 9 am each morning. Next, participants were instructed to complete one exercise each day for the next ten days. Participants were then presented with a packet containing 10 copies of the TMS, as well as the exercise log. Participants were instructed to complete the TMS and the log form after each daily exercise. Participants who were randomly assigned to the null control condition did not engage with any smartphone app, were not given a packet of TMS surveys, and were not provided with a daily log form.

Next, in the first study session, participants in all conditions were informed of the procedure for completing the state self-esteem measure and state affect. A survey distribution and survey management application called SurveySignal (surveysignal.com; Hofmann & Patel,

2015) was used to notify participants when to complete the modified, state version of the RSES-L and the mood questionnaire. Specifically, SurveySignal sent SMS messages to participants' smartphones at 10:00 AM and 10:00 PM each day for 10 days. This SMS message prompted participants that it was time to complete their questionnaire and provided participants with a SurveyMonkey (www.surveymonkey.com, San Mateo, California, USA) link. This link contained the modified, state version of the RSES as well as the mood questionnaire. Thus, SurveySignal was used to notify participants when to complete the questionnaire, and this software allowed participants to complete the questionnaires on their personal smartphones. In the first study session, participant phone numbers were collected and a test SMS message was sent to participants to ensure that they properly received the messages. Participants were then thanked for their time. The first study session lasted approximately one hour, and participants were given one hour of course credit for their participation.

The second study session occurred in the lab, approximately 10 days ($M = 13.22$, $SD = 3.62$, range: 10 – 42 days)² after the first study session. As in the first study session, upon entering the lab, participants were greeted by an experimenter and seated at an individual workstation. Participants completed the following measures in the following order: MAAS, FFMQ, RSES-L, and HUS as an assessment of the amount of hassles and uplifts experienced over the 10 days in which self-esteem stability was measured. Then, participants assigned to the mindfulness training and cognitive training conditions were asked to return the completed TMS questionnaires and the exercise log. Participants in the mindfulness practice condition were also asked to show the experimenter the total amount of time spent meditating and the total number of

² The number of days between study session 1 and study session 2 was not significantly associated with any of the primary variables in the study ($ps > .17$)

exercises completed as measured by the mindfulness training app³. Lastly, participants were debriefed. The second study session was designed to last one hour, and participants were given two hours of course credit for their participation.

In the second study session, participants were reimbursed for their participation in the study during the 10-day period. In addition to the three hours of course credit awarded to participants for taking part in study sessions one and two, participants received additional reimbursement based on the number of state self-esteem and affect measures they completed. Participants had the option to choose between financial compensation and additional course credits. More specifically, for participants choosing the financial compensation, they received \$0.50 for each survey they completed during the self-esteem stability assessment phase. Choosing this option resulted in a maximum payment of \$10.00. For participants choosing the course credit compensation, they received .25 hours of course credit for each survey they completed during the self-esteem stability assessment phase. Choosing this option resulted in a maximum compensation of 5 additional course credits.

Aim 1

The purpose of this aim was to investigate the extent to which trait mindfulness and self-esteem stability are related. Correlational analyses were utilized to replicate and expand upon the initial preliminary evidence, indicating that greater mindfulness is associated with more self-esteem stability. In particular, the present study was designed to control for potential third

³ Due to errors in data collection procedures, time spent meditating was only recorded for 35 of the 50 participants in the mindfulness training condition. Of those in the mindfulness training condition for which time spent meditating was measured, the average time spent meditating was 91.8 minutes ($SD = 19.94$). Time spent meditating was not significantly associated with self-esteem stability, mood stability, hassles, uplifts, or any of the outcome variables ($ps > .15$).

variables (i.e., mood variability, self-esteem level, daily hassles and uplifts) and isolate the variable of interest – self-esteem stability.

It is important to demonstrate that self-esteem stability, not mood variability, is being assessed. Previous literature has shown that although self-esteem stability and mood variability are positively correlated, self-esteem stability is significantly related to personality traits even when controlling for mood variability, suggesting that self-esteem stability and mood variability are independent constructs (Oosterwegel, Field, Hart, & Anderson, 2001). However, it is necessary to demonstrate that self-esteem stability is related to trait mindfulness independent of variability in mood, particularly as trait mindfulness is related to mood (e.g., Brown & Ryan, 2003; see Giluk, 2009, for a meta-analysis). Therefore, positive mood variability and negative mood variability were included as covariate variables. Self-esteem level was also included as a covariate variable, because self-esteem level is associated with both trait mindfulness (Randal, Prat, & Bucci, 2015) and self-esteem stability (e.g., Kernis et al., 1998). Furthermore, daily hassles and uplifts were included as covariate variables. Previous literature has demonstrated that more unstable self-esteem is associated with more daily hassles (Kernis et al., 1998). Participants who experienced more daily hassles during the study period may have had more elevated instability scores simply due to the greater frequency of daily stressors during the assessment period.

Only participants randomly assigned to the null control condition were included in the Aim 1 analyses. Thus, none of these participants completed the mindfulness training or the cognitive training interventions. It was expected that trait mindfulness would be significantly associated with more stable self-esteem, even when controlling for mood variability, self-esteem

level, and daily hassles and uplifts. That is, it was anticipated that individuals higher in trait mindfulness would tend to report more stable self-esteem.

Aim 1 Results

The distribution plot, as well as skewness and kurtosis, for each measure was examined before statistical analysis. The distribution of scores on all of the measures approximated a normal distribution. Thus, data transformations were not conducted. Descriptive statistics for all of the primary measures are presented in Table 2. On average, participants responded to 17.40 ($SD = 1.44$) of the possible 20 daily surveys, which equates to 87.0% ($SD = .07$) of the daily surveys.

Bivariate correlations and independent samples *t*-tests were conducted to explore whether any of the demographic variables were related to any of the primary measures. Older age was related to higher FFMQ-nonreactivity and more stable positive mood. White/Caucasian participants reported fewer uplifts than non-White participants. Male participants possessed higher RSES-L, FFMQ-awareness, and MAAS than female participants. None of the demographic variables significantly related to self-esteem stability, so no demographic variables were included as covariates in the primary analyses.

Correlations

To determine the simple associations between the primary variables of interest, Pearson bivariate correlations among the measures of mindfulness (MAAS, FFMQ), self-esteem instability, self-esteem level (RSES-L), positive mood variability, negative mood variability, hassles (HUS-hassles), and uplifts (HUS-uplifts) were examined (see Table 3). Generally, all measures of mindfulness were positively correlated. However, the relations between the MAAS

and FFMQ-nonreactivity; FFMQ-observing and FFMQ-nonjudging; FFMQ-observing and FFMQ-nonreactivity; and FFMQ-nonjudging and FFMQ-nonreactivity were not significant.

Self-esteem instability was significantly associated with MAAS and FFMQ-awareness, such that that higher levels of mindfulness were associated with more stability in self-esteem. Self-esteem instability was not significantly associated with FFMQ-observing, FFMQ-describing, FFMQ-nonjudging and FFMQ-nonreactivity. Self-esteem instability was not significantly associated with RSES-L. More variability in positive and negative mood was significantly associated with less stability in self-esteem. Participants who experienced higher levels of uplifts tended to possess more stable self-esteem, but HUS-hassles was not significantly related to self-esteem stability.

All measures of mindfulness except for FFMQ-observing were significantly, positively correlated with RSES-L, such that higher levels of mindfulness were associated with higher levels of self-esteem. MAAS and FFMQ-awareness were significantly correlated with positive mood variability, such that higher levels of mindfulness were associated with less variability in positive mood. No other mindfulness measures significantly related to positive mood variability. MAAS, FFMQ-awareness, and FFMQ-nonreactivity were significantly correlated with negative mood variability, such that higher levels of mindfulness were associated with less variability in negative mood. No other mindfulness measures significantly related to negative mood variability. FFMQ-describing was significantly, negatively related to HUS-hassles, but no other mindfulness measure was related to hassles. None of the mindfulness measures were related to uplifts.

Regression Analyses

A series of hierarchical multiple regression analyses were performed to determine whether trait mindfulness was associated with self-esteem instability, controlling for mood variability, self-esteem level, daily uplifts, and daily hassles. In the first step of each analysis, the covariate variables (positive mood variability, negative mood variability, RSES-L, HUS-hassles, and HUS-uplifts) were entered as predictors of self-esteem stability. In the second step of each analysis, one of the measures of trait mindfulness (MAAS, FFMQ subscales) was entered as a predictor variable. A separate hierarchical multiple regression analysis was conducted for each of the measures of trait mindfulness, resulting in a total of six separate regressions (see Table 4 for a summary of the results).

Step 1 was identical in all six hierarchical regressions. As a whole, these variables accounted for a significant amount of variability in self-esteem instability, $F(5, 90) = 16.79, p < .001, R^2 = .48$. Positive mood variability ($B = 2.02, SE B = .60, \beta = .38, t = 3.37, p = .001$) and negative mood variability ($B = 1.81, SE B = .65, \beta = .31, t = 2.77, p = .007$) uniquely and significantly predicted self-esteem instability. That is, greater variability in positive mood and negative mood were associated with greater variability in self-esteem. Hassles ($B = 0.01, SE B = .01, \beta = -.01, t = 0.04, p = .97$), uplifts ($B = -.02, SE B = .01, \beta = -.16, t = -1.82, p = .07$), and self-esteem level ($B = -.02, SE B = .05, \beta = -.03, t = -0.41, p = .68$) did not uniquely predict self-esteem instability. In Step 2, none of the trait mindfulness measures significantly predicted self-esteem instability when controlling for the covariate variables⁴.

Aim 1 Discussion

⁴ Because previous research has demonstrated that depression is related to self-esteem stability, depression was assessed via the Beck Depression Inventory. Depression was not significantly associated with self-esteem stability, $r(94) = .16, p = .12$.

The purpose of Aim 1 was to investigate the extent to which trait mindfulness and self-esteem stability are related. It was predicted that individuals with higher levels of trait mindfulness would tend to report more stable self-esteem, and that the relation between trait mindfulness and self-esteem stability would be present when controlling for self-esteem level, mood variability, hassles, and uplifts. There was modest support for this hypothesis. Correlational analyses revealed that two of the six measures of trait mindfulness were significantly associated with self-esteem stability. Greater scores on the MAAS and FFMQ-awareness were correlated with more stable self-esteem, but effect sizes were small. The other four measures of trait mindfulness were not significantly related to self-esteem stability.

Hierarchical multiple regression analyses did not support the association between trait mindfulness and self-esteem stability, above and beyond mood variability, hassles, uplifts, and self-esteem level. The null results of the multiple regression analyses are not surprising given that the correlational analyses only revealed two mindfulness measures to be associated with self-esteem stability and that effect sizes were smaller than anticipated. Due to the fact that effect sizes were small and that a substantial number of participants were excluded from data analysis, it is likely that this sample was not adequately powered. Without sufficient power, it cannot be determined whether trait mindfulness is associated with self-esteem stability above and beyond mood variability, self-esteem level, hassles, and uplifts.

Aim 2

The goal of the Aim 2 was to experimentally determine whether engaging in regular mindfulness practice increases self-esteem stability. All participants who met the study inclusion criteria (i.e., participants who were randomly assigned to the mindfulness training, cognitive training, and null conditions) were included in data analysis ($N = 190$). Self-esteem stability was

compared across the mindfulness training, the cognitive training, and the null control condition. As with Aim 1 analyses, mood variability, self-esteem level, daily hassles, and daily uplifts were included as potential covariates. It was expected that participants would report more stable self-esteem in the mindfulness training condition than the active control or the null control conditions. That is, it was anticipated that individuals who engaged in mindfulness training would reported more stable self-esteem.

Aim 2 Results

The distribution plot, as well as skewness and kurtosis, for each measure was examined before statistical analysis. The self-esteem instability index contained significant positive skew (e.g., skewness/*SD* skewness > 3.2). A square root transformation successfully normalized the distribution of self-esteem instability scores. The overall pattern of results did not differ when the transformed versus the non-transformed self-esteem instability measure was used. So, for ease of interpretation, the non-transformed self-esteem instability index was used in all Aim 2 analyses. The distribution of scores on all other measures approximated a normal distribution, and no other data transformations were conducted. Descriptive statistics for all of the primary measures are presented in Table 5. On average, participants responded to 17.39 (*SD* = 1.47) of the possible 20 daily surveys, which equates to 87.0% (*SD* = .07) of the daily surveys.

Bivariate correlations and independent samples *t*-tests were conducted to explore whether any of the demographic variables were related to any of the primary measures. Higher income was associated with higher levels of self-esteem ($r(188) = .17, p = .02$) and fewer reported hassles ($r(188) = -.27, p < .001$). Older age was significantly associated with more stability in positive mood ($r(188) = -.19, p = .01$), higher levels of FFMQ-nonreactance ($r(188) = .15, p = .046$), and more uplifts ($r(188) = .17, p = .02$). Males reported higher levels of self-esteem

($t(187) = 2.90, p = .004$), higher levels of FFMQ-nonreactance ($t(187) = 2.23, p = .03$), and fewer hassles ($t(187) = -2.25, p = .03$) than females. No other gender differences were present (all $ps > .06$). There were no significant differences between White and non-White participants on any of the primary measures (all $ps > .06$). None of the demographic variables significantly related to self-esteem instability (all $ps > .23$), so no demographic variables were included as covariates.

Manipulation Check

To serve as a manipulation check, two 10 (Time: day of intervention) by 2 (Condition: mindfulness intervention and active control) mixed model analyses of variance (ANOVAs) were conducted to determine whether there were differences in state mindfulness between the mindfulness intervention and the cognitive training control intervention across time. In both ANOVAs, condition was entered as a between-subjects variable, and time was entered as a within-subjects variable. State mindfulness as assessed by the TMS was entered as the dependent variable. One ANOVA was conducted with TMS-decentering as the dependent variable, and one ANOVA was conducted with TMS-curiosity as the dependent variable.

First, the 10 (time) by 2 (condition) mixed-model ANOVA with TMS-curiosity entered as the dependent variable was conducted. Results indicated that there was no significant main effect of condition, $F(1,84) = 1.10, p = .30, \eta_p^2 = .01$. There was a significant main effect of time, $F(9,756) = 3.45, p < .001, \eta_p^2 = .04$. However, this main effect of time was qualified by a significant time by condition interaction, $F(9,756) = 2.81, p = .003, \eta_p^2 = .03$ (see Figure 1). Next, simple effect analyses were conducted to determine the time points in which TMS-curiosity differed between conditions. TMS-curiosity did not differ between conditions during the first eight days of the intervention (all $ps > .16$). There was a trend such that participants in the mindfulness training intervention reported higher levels of TMS-curiosity than participants in

the cognitive training intervention ($p = .06$). On day tenth day of the intervention, participants in the mindfulness training intervention reported higher levels of TMS-curiosity than participants in the cognitive training intervention ($p = .02$). These results indicate that state mindfulness during each exercise was higher in the mindfulness training condition than the cognitive training condition on Day 9 and Day 10.

Next, the 10 (time) by 2 (condition) mixed-model ANOVA with TMS-decentering entered as the dependent variable was conducted. Results indicated that there was no significant main effect of condition, $F(1,84) = 1.38, p = .24, \eta_p^2 = .02$. There was a significant main effect of time, $F(9,756) = 10.59, p < .001, \eta_p^2 = .11$. However, this main effect of time was qualified by a significant time by condition interaction, $F(9,756) = 3.40, p < .001, \eta_p^2 = .04$ (see Figure 2). Next, simple effect analyses were conducted to determine the time points in which TMS-decentering differed between conditions. TMS-decentering did not differ between conditions during the first nine days of the intervention (all $ps > .12$). TMS-decentering was higher in the mindfulness training condition than the cognitive training condition on Day 10, $p = .01$. These results indicate that state mindfulness during each exercise was higher in the mindfulness training condition than the cognitive training condition Day 10.

Differences between Conditions

Several 2 (Time: study session 1 and study session 2) by 3 (Condition: mindfulness intervention, active control, and null control) mixed model ANOVAs were conducted to determine whether there were differences in trait mindfulness and self-esteem level between the three conditions across time. For each analysis, condition was entered as a between-subjects variable and time was entered as a within-subjects variable.

When MAAS, FFMQ-observing, and FFMQ-awareness were entered as the dependent variable, there were no main effects or interactions ($ps > .08$). When FFMQ-describing was entered as the dependent variable, there was a main effect of time $F(1,187) = 13.62, p < .001, \eta_p^2 = .07$, which was qualified by a significant time by condition interaction, $F(2,187) = 7.91, p = .001, \eta_p^2 = .08$. Post hoc analyses revealed that FFMQ-describing increased in the mindfulness training and cognitive training condition but did not change in the null control condition. When FFMQ-nonjudging was entered as the dependent variable, there was a main effect of time $F(1,187) = 5.77, p = .02, \eta_p^2 = .03$, whereby FFMQ-awareness increased over time. When FFMQ-nonreactance was entered as the dependent variable, there was a main effect of condition $F(2,187) = 3.42, p = .04, \eta_p^2 = .04$, whereby participants in the cognitive training intervention reported higher levels of FFMQ-nonreactance than the participants in the mindfulness training condition.

When RSES-L was entered as the dependent variable, there was no main effect of condition, $F(2,187) = 0.63, p = .53$, but there was a significant main effect of time, $F(1,187) = 79.80, p < .001, \eta_p^2 = .30$. This main effect of time was qualified by a significant time by condition interaction, $F(2,187) = 6.27, p = .002, \eta_p^2 = .06$. Post hoc analyses revealed that while all conditions increased in self-esteem level over time, the amount of increase in self-esteem in the cognitive training and mindfulness training conditions was greater than the increase in self-esteem level in the null control condition.

Then, several one-way ANOVAs were conducted to determine whether there were differences in positive mood variability, negative mood variability, hassles, and uplifts between the three conditions. Results indicated that there were no significant differences between

conditions on in positive mood variability, negative mood variability, hassles, and uplifts (all p s $> .17$).

Primary Analyses

A 2 (Time: first five days of the intervention and second five days of the intervention) by 3 (Condition: mindfulness intervention, active control, and null control) mixed model analysis of covariance (ANCOVA) was conducted to determine whether there were differences in self-esteem instability between the three groups across time, controlling for mood variability, hassles, uplifts, and self-esteem level. Condition was entered as a between-subjects variable. Time was entered as a within-subjects variable. Specifically, a Time 1 self-esteem instability index was calculated using the measures of state self-esteem gathered in the first five days of the intervention. A Time 2 self-esteem instability index was calculated using the measures of state self-esteem gathered in the last five days of the intervention. Results revealed that there was no significant main effect of condition, $F(2,182) = 0.15, p = .86$. There was a significant main effect of time, $F(1,182) = 7.08, p = .008, \eta_p^2 = .04$, such that self-esteem became more stable over time. There was no significant time by condition interaction, $F(2,182) = 3.05, p = .05, \eta_p^2 = .03$. Although the time by condition interaction did not reach conventional levels of significance, the interaction was probed for exploratory purposes. Simple effect analyses were conducted to determine whether there were differences between self-esteem instability during the first five days of the intervention versus self-esteem instability during the last five days of the intervention. Results indicated that the self-esteem instability index was lower during the last five days of the intervention than the first five days of the intervention for the null control condition ($p = .002, \eta_p^2 = .05$). This indicates that self-esteem became more stable over time for participants in the null control condition. There was no difference in self-esteem instability

between the first five days of the intervention and the last five days of the intervention for participants in the mindfulness training ($p = .39$) or the cognitive training conditions ($p = .38$).

Refer to Table 6 for means and standard deviations by time and condition.

Aim 2 Discussion

The purpose of the second aim was to explore whether the relation between mindfulness and self-esteem stability is causal. That is, we examined whether regular engagement in a brief mindfulness intervention increases self-esteem stability. It was hypothesized participants in the mindfulness training intervention would report more stable self-esteem over time and that participants in the null control and active control groups would report no such changes in self-esteem stability over time.

The hypothesis that the mindfulness training intervention would cause greater self-esteem stability was not supported. Results indicated that self-esteem did become more stable across time. However, the improved stability in self-esteem did not differ by condition. Thus, there was no evidence that mindfulness training improved self-esteem stability in the present study. These null results may be explained by the fact that the relation between mindfulness and self-esteem stability may be smaller than anticipated, which introduces the possibility that the current study was not adequately powered to detect such effects. Furthermore, it is possible that although the mindfulness training did successfully induce states of mindfulness, the mindfulness training was too brief to produce changes in self-esteem stability. Perhaps engagement in a longer (e.g., 8 week) mindfulness training program would produce the anticipated effects on self-esteem stability. Lastly, it is possible that the practice of monitoring mood and states of self-esteem alone (which occurred in all three conditions) improved stability of self-esteem. This would explain why a main effect of time was observed whereby self-esteem became more stable over

time. If this were the case, it would be more difficult to observe an effect of the mindfulness training over and above the effect of monitoring mood and state self-esteem.

General Discussion

The purpose of the present research was to explore the relation between mindfulness and self-esteem stability. It was predicted that higher levels of mindfulness would be associated with more stable self-esteem and that mindfulness training would cause more stable self-esteem. Correlational and experimental approaches were utilized to clarify the mindfulness – self-esteem stability relation. Correlational analyses revealed some small associations between some measures of trait mindfulness and self-esteem stability whereby individuals with higher levels of acting with awareness tended to report more stable self-esteem. However, these associations were small in effect size and inconsistent across mindfulness measures. Furthermore, there were no significant associations between mindfulness and self-esteem stability when controlling for positive mood variability, negative mood variability, hassles, uplifts, and self-esteem level. So, there was only modest support for the prediction that mindfulness would be associated with more stable self-esteem. The second aim focused on experimentally testing whether brief mindfulness training, relatively to control conditions, delivered via a smartphone app would increase self-esteem stability. Results indicated that self-esteem became more stable across time. However, the improved stability in self-esteem did not differ by condition. Thus, there was no evidence to support the hypothesis that mindfulness training causes more stable self-esteem, above placebo effects.

The correlational analyses indicated that only some aspects of mindfulness were related to self-esteem stability. This is not necessarily surprising as mindfulness is conceptualized as a multi-dimensional construct (e.g., Baer et al., 2006) consisting of distinct components and the

fact that small to medium size associations between mindfulness measures was observed. Of the six measures of trait mindfulness, only the MAAS and FFMQ-awareness significantly correlated with self-esteem stability. This is noteworthy, as the MAAS and FFMQ-awareness subscales conceptually measure a similar component of mindfulness. The MAAS was designed to measure open and receptive attention to what is taking place in the present moment (Brown & Ryan, 2003). FFMQ-awareness assesses the degree to which one acts with awareness, or attends to one's own current behavior and activities (Baer et al., 2008). In fact, some items in the MAAS are identical to items in the FFMQ-awareness. Additionally, the two previous studies examining mindfulness and self-esteem stability (Ford & Shook, 2017; Heppner & Kernis, 2007) found significant associations between MAAS and self-esteem stability. Thus, the MAAS and FFMQ-awareness both assess mindful attention to present moment experiences, and the finding that mindful attention is related to more stable self-esteem appears to be a reliable and replicable finding. It seems that acting with mindful awareness, compared to other components of mindfulness, has important implications for self-esteem stability.

Although acting with mindful awareness is reliably associated with more stable self-esteem, the significant correlations between MAAS and the FFMQ-awareness and self-esteem stability were reduced to non-significance when controlling for important covariate variables. Specifically, none of the measures of trait mindfulness predicted self-esteem stability, when controlling for positive mood variability, negative mood variability, hassles, uplifts, and self-esteem level. A lack of sufficient power may explain these null findings. A priori power analyses were conducted assuming medium effect sizes. However, the observed effects sizes were smaller than the effects observed in the pilot study (Ford & Shook, 2017). Additionally, a significant portion of participants in the null control condition were not retained for data analysis.

Specifically, only 96 of the initially recruited 145 participants randomly assigned to the null control condition were included in Aim 1 analyses. So, even if there was a significant relation between mindfulness and self-esteem stability above and beyond control variables, the present study was likely not sufficiently powered to detect such effects.

In addition to insufficient power, there are a couple of other possible interpretations for the null regression results. First, it is possible that there were multicollinearity issues between the mood variability measures and self-esteem stability. There is some evidence that mood variability and self-esteem stability are distinct constructs (Oosterwegel, Field, Hart, & Anderson, 2001). Yet, positive mood variability and negative mood variability were highly correlated with self-esteem stability ($r_s > .60$). While there were no notable issues with multicollinearity observed statistically, it is still possible that the two mood variability measures were at least somewhat redundant in the regression analyses. After controlling for mood variability, there may not have been enough variance in self-esteem stability to detect possible effects with mindfulness. Additionally, when completing the daily surveys, participants completed the revised state self-esteem measure and then immediately reported their mood. Because participants reported state self-esteem and state mood at the same time, they may have had difficulty distinguishing their mood and self-esteem. Second, there may have been indirect effects of mindfulness on self-esteem stability through mood variability. Put another way, mood variability might mediate the relation between mindfulness and self-esteem stability. Mindfulness is related to positive and negative mood variability (Hill & Updegraff, 2012) and the current study found that mindful attention to present action was related to more stable self-esteem. Theoretically, it is possible that mindful awareness might be related to more stable self-esteem at least in part because mindfulness is associated with less variability in mood. This

mediation model was not tested in the present study, but future work might consider testing such a model.

The second aim of the study was to test whether mindfulness is casually related to self-esteem stability. Specifically, it was examined whether mindfulness training improved self-esteem stability. Results did not support this hypothesis. Self-esteem did in fact become more stable over time, but the degree to which self-esteem became more stable did not differ by condition. Thus, the present research does not demonstrate that brief mindfulness interventions improve stability of self-esteem.

It is possible that some of the concerns related to small sample size and inadequate power raised with regard to the first aim also explain the null findings in Aim 2. It was anticipated that mindfulness would have a medium-sized effect on self-esteem stability; yet, only small associations were observed. Furthermore, of the 300 participants enrolled in the study, only 190 were retained for data analysis. That is, about 37% of the recruited sample were excluded from data analysis. The combination of effect sizes that were smaller than anticipated and large amounts of excluded participants raises concerns that the study was not adequately powered.

Furthermore, it could be argued that the limitations of the mindfulness training intervention (e.g., 10 days of Headspace app) explain the null findings. Before discussing the limitations of the mindfulness training intervention, the relative strengths of the Headspace app should be noted. First, one meta-analysis and review found that mindfulness based interventions delivered online (e.g., website or smartphone app) reduce depression and anxiety and increase trait mindfulness with small but significant effect sizes (Spijkerman, Pots, & Bohlmeijer, 2016). So, mindfulness training interventions can effectively be delivered online. However, studies in the review all lasted at least eight weeks and were adapted from previously established

mindfulness based interventions (e.g., Mindfulness Based Cognitive Therapy). Second, the Headspace app was the highest-rated mindfulness app according to a structured app scoring system (Mani et al., 2015). Third, randomized control trials have demonstrated that 10-day mindfulness training through Headspace reduces depression, stress, and irritability and increases positive affect (Economides, Martman, Bell, & Sanderson, 2018; Howells, Ivtzan, & Eiroa-Orosa, 2016). Thus, previous research shows that brief use of Headspace has important therapeutic effects. Furthermore, the present research found that states of mindfulness were successfully induced during engagement in the mindfulness training exercises. Importantly, manipulation check analyses demonstrated that state mindfulness during daily exercises increased over time in the mindfulness training condition, but no such effect was observed in the active control condition.

Despite the strengths of using Headspace to train mindfulness skills, there are some limitations of using this app which may help shed light on the observed null findings. One limitation is the brevity of the mindfulness training intervention. The mindfulness training intervention consisted of a maximum of about 120 total minutes of mindfulness training over the course of ten days. Previous research shows that even more brief mindfulness training interventions (e.g., 20 minutes per day for three days) can produce salutary effects mood, depression, and heart rate (Zeidan, Johnson, Gordon, Goolkasian, 2010). However, the amount of mindfulness training delivered through Headspace may have been insufficient for producing changes in self-esteem stability. Although manipulation check analysis revealed that mindfulness training successfully induced states of mindfulness, the mindfulness intervention did not increase trait mindfulness, which again might suggest that the mindfulness training was too brief. Second, the correlational analyses indicated that only one component of mindfulness (e.g., acting with

mindful attention) is associated with self-esteem stability. Perhaps Headspace did not provide enough training on this specific aspect of mindfulness to cause changes in self-esteem stability. It may be the case that mindfulness training that focuses on acting with mindful awareness is critical for improving stability of self-esteem. A third limitation of the mindfulness training intervention is the fact that it was not based on a previously established mindfulness-based intervention. Spijkerman et al. (2016) found that mindfulness training interventions delivered online that are based on mindfulness-based interventions produce salutary outcomes. Future work exploring whether mindfulness training causes more self-esteem might consider using mindfulness training programs that are more directly based on previously established mindfulness based interventions, such as Mindfulness-Based Cognitive Therapy (Segal, Williams, & Teasdale, 2002) or Mindfulness Based Stress Reduction (Kabat-Zinn, 1982).

Overall, self-esteem stability increased across time. However, the main effect of time was not qualified by a significant time by condition interaction. So, the effect of increased self-esteem stability over time cannot be attributed to mindfulness training. This suggests that some other aspect of participant experience common to all conditions caused the improved stability in self-esteem over time. Perhaps the practice of reflecting on and reporting state self-esteem and state mood two times per day for ten days impacted self-esteem stability over time. It is possible that responding to survey items regarding mood and state self-esteem helped to disrupt automatic affective responses and downstream effects of those affective responses, thereby improving self-esteem stability.

Scientific literature on mood labelling and affect labelling support the notion that identifying affective states has important benefits for psychological health. Mood labelling refers to one's ability to identify their own mood states with some degree of completeness and put a

name to it (Swinkels & Giuliano, 1995). Individuals who report higher levels of mood labelling tend to also report higher levels of positive affect, self-esteem, life satisfaction, and greater satisfaction with social support (Swinkels & Giuliano, 1995; Wismeijer, Van Assen, Sijtsma, & Vingerhoets, 2009). It is argued that labelling one's mood states helps individuals sort out affective responses to events and fosters the use of productive emotion regulation strategies. A similar literature regarding affect labeling also suggests that naming mood states produces salutary psychological effects. Affect labelling refers to the action of putting feelings into words (Lieberman et al., 2007). Research in affect labelling has demonstrated that putting feelings into words after being shown emotional images reduces intensity of affective responses (Constantinou, Van Den Houte, Bogaerts, Van Diest, & Van den Bergh, 2014; Lieberman, Inagaki, Tabibnia, & Crockett, 2011). Thus, the action of labeling one's mood states helps regulate affective responding. It could be the case then, that labeling one's state self-esteem similarly helps to dampen the effect of external events on self-esteem. If this were true, this might explain why self-esteem stability increased over time across conditions.

Other explanations for the finding that self-esteem became more stable over time, regardless of condition, exist as well. It is possible that practice effects account for the main effect of time. In other words, participants might have been more likely to respond to the daily surveys in similar ways across time. Participants might have felt fatigued from responding to the same items twice per day for ten days, and as a result might have responded with less variability over time. If this were the case, self-esteem stability may have artificially increased over time. That is, self-esteem might not have actually become more stable over time, but rather participants may have responded with less variability over time. Alternatively, first-year students transitioning to university and adapting to the challenges that this transition brings might explain

the finding that self-esteem became more stable over time. Just over 41% of the sample consisted of first-year students. First-year students adjusting to the demands of college students and improving in their coping with these challenges over time might explain the finding that self-esteem became more stable across time.

Limitations and Future Directions

It is important to consider the limitations of the present work. First, there are concerns that the study was not adequately powered. A priori power analyses were conducted. However, the relations between mindfulness and self-esteem stability were smaller than anticipated, and significant attrition was observed. This combination of factors might have contributed to an underpowered study. Without sufficient power, it cannot be determined whether trait mindfulness predicts self-esteem stability above and beyond important covariates. Future studies clarifying the relation between mindfulness and self-esteem stability should strive for larger samples sizes.

As noted, over 30% of participants were excluded due to attrition, missing data, or outlying scores. In addition to reducing statistical power, this degree exclusion raises concerns. Differences between those included in data analysis and those excluded were explored. Those who were excluded were more likely to be non-white. Those included and those excluded from data analysis did not differ on any of the primary variables of the study. However, the possibility remains that those that did not complete the entirety of the study differed from those who were included, which might introduce bias.

A third limitation of the present work regards the choice and duration of the mindfulness training intervention. The benefits and drawbacks of using Headspace as a mindfulness training intervention was reviewed in detail above. It should be restated though that the relative brevity of

the mindfulness training and the fact that Headspace is not adapted from a previously established mindfulness based intervention are clear limitations. Future studies should increase the duration of mindfulness training. Future work might also consider utilizing Mindfulness Based Cognitive Therapy or Mindfulness Based Stress Reduction to explore whether increasing mindfulness causes more stable self-esteem.

Additionally, in the present study, the mindfulness training intervention (or the control intervention) was delivered concurrently with the measurement of self-esteem stability. Measuring self-esteem stability at the same time in which mindfulness was being trained made it impossible to disentangle the possible effects of mindfulness training and affect labelling. To rule out the possibility that monitoring and logging mood and state self-esteem increase self-esteem stability, future studies might separate mindfulness training and self-esteem stability indexing. In other words, it would be advantageous to measure baseline self-esteem stability, then to deliver a mindfulness training intervention, and then to measure post-intervention self-esteem stability. This would provide a clearer picture of the effect of mindfulness training on self-esteem stability.

Furthermore, there are limitations regarding the measurement of hassles and uplifts. Hassles and uplifts were assessed via a single retrospective self-report measure. Participants indicated the extent to which they were affected by various life stressors at study session two. Because participants were reporting their hassles and uplifts retrospectively, they may not have accurately indicated the degree to which life events impacted them. To further clarify the relation between mindfulness, self-esteem stability, hassles, and uplifts, future research should consider assessing hassles and uplifts more frequently (e.g., daily or multiple times per day). By assessing stressors more frequently, participants may more accurately report hassles and uplifts because

they would not have to rely on long-term memory. Additionally, assessing hassles and uplifts on a more frequent basis would make it possible to explore the immediate impact of daily stressors on self-esteem stability and whether or not mindfulness affects that relation. Despite these benefits, there might also be some drawbacks of regularly assessing daily hassles and uplifts. First, participant load should be considered. The present study utilized a previously validated measure that consisted of 106 items. If future studies attempt to measure stressors on a daily basis, researchers would need to demonstrate that they can reliably assess hassles and uplifts with fewer items. Secondly, just as affect labelling might affect self-esteem stability, the practice of labelling hassles and uplifts might also have the unintended consequence of influencing outcomes variables.

Lastly, it may be important to consider other ways in which the dynamics of self-esteem can be indexed. In the present study, self-esteem stability was operationalized as the standard deviation of state self-esteem scores across time, which is consistent with all previous research on self-esteem stability (e.g., Greenier et al., 1999, Kernis et al., 1998; Paradise & Kernis, 2000). Future work might also explore alternative ways to assess the dynamics of self-esteem across time. For example, in addition to stability of self-esteem, it might also be worthwhile to assess the inertia of self-esteem. Inertia of self-esteem refers to the extent to which a state of self-esteem persists from one point to another point. Previous research demonstrates that negative affect inertia is positively correlated with depressive symptoms (Kuppens, Allen, & Sheeber, 2010). Self-esteem inertia might similarly have implications for emotional distress. Future work should examine alternative indices of self-esteem stability.

Conclusions

The current research aimed to explore the relation between mindfulness and self-esteem stability. It was predicted that mindfulness would be related to more stable self-esteem and that engagement in a mindfulness training intervention would increase self-esteem stability. Results revealed small associations between certain aspects of trait mindfulness (e.g., acting with awareness) and self-esteem stability, though other components of mindfulness did not significantly relate to self-esteem stability. The association between acting with awareness and self-esteem stability became non-significant when controlling for important covariate variables. When comparing participants who completed mindfulness training versus control conditions, it was observed that self-esteem became more stable over time. However, the degree of change in self-esteem stability did not differ between the mindfulness training condition and control conditions. As such, there was no evidence that mindfulness training improved self-esteem stability. Together, the overall pattern of results suggests a small association between the acting with awareness component of mindfulness and self-esteem stability may exist, but brief mindfulness training may not improve self-esteem stability.

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Table 1. Participant demographic characteristics by condition

	Null Control Condition (<i>n</i> = 96)		Cognitive Training Condition (<i>n</i> = 44)		Mindfulness Training Condition (<i>n</i> = 50)	
	<i>M</i> (<i>n</i>)	<i>SD</i> (%)	<i>M</i> (<i>n</i>)	<i>SD</i> (%)	<i>M</i> (<i>n</i>)	<i>SD</i> (%)
Age	19.67	3.24	19.66	1.38	19.38	1.40
Gender						
Female	81	84.4%	35	79.5%	43	86.0%
Male	15	15.6%	9	20.5%	6	12.0%
Other	0	0.0%	0	0.0%	1	2.0%
Ethnicity						
White	90	95.8%	37	84.1%	43	86.0%
Black	5	5.2%	3	6.8%	4	8.0%
Latino(a)	4	4.2%	2	4.5%	5	10.0%
Asian	2	2.1%	3	6.8%	2	4.0%
Native American	1	1.0%	0	0.0%	1	2.0%
Other	3	3.1%	2	4.5%	3	6.0%
Meditation Experience						
Yes	18	18.8%	9	20.5%	4	8.0%
No	78	81.3%	35	79.5%	46	92.0%
Yoga Experience						
Yes	27	28.1%	12	27.3%	5	10.0%
No	69	71.9%	32	72.7%	45	90.0%
Tai Chi Experience						
Yes	1	1.0%	0	0.0%	1	2.0%
No	95	99.0%	44	100%	49	98.0%

Note. Participants were allowed to select more than one response regarding ethnicity. So, percentages of each ethnicity in each condition may not sum to 100%.

Table 2. Descriptive statistics for all measures for participants in the null control condition

Measure	Mean	<i>SD</i>	Range	α
MAAS (S1)	3.46	.71	1.67-5.33	.86
FFMQ – observing (S1)	26.77	5.33	9.00-37.00	.77
FFMQ – describing (S1)	25.56	5.76	11.00-40.00	.88
FFMQ – awareness (S1)	24.19	5.36	8.00-37.00	.86
FFMQ – nonjudging (S1)	24.11	6.34	8.00-37.00	.90
FFMQ – non-reactivity (S1)	20.07	3.95	11.00-32.00	.73
RSES-L (S1)	27.95	4.36	16.00-36.00	.77
Self-Esteem Instability (10 day period)	5.34	2.62	0.84-11.94	-
Positive Mood Variability (10 day period)	1.34	.50	0.23-2.50	-
Negative Mood Variability (10 day period)	1.25	.45	0.23-2.37	-
HUS – Hassles (S2)	40.39	19.60	2.00-90.00	.90
HUS – Uplifts (S2)	55.57	22.61	17.00-115.00	.90

Note. SD=Standard Deviation; MAAS =Mindful Attention Awareness Scale; FFMQ = Five Facet Mindfulness Questionnaire; RSES-L = Rosenberg Self-Esteem Scale – Level; HUS = Hassles and Uplifts Scale; S1 = Session 1; S2 = Session 2.

Table 3. Bivariate correlations between variables for participants in the null condition

	Correlation Coefficients											
	1	2	3	4	5	6	7	8	9	10	11	12
1. Self-Esteem Intability	1											
2. MAAS	-.23*	1										
3. FFMQ-observing	-.03	.24*	1									
4. FFMQ-describing	-.12	.27**	.27**	1								
5. FFMQ-awareness	-.23**	.74**	.29**	.38**	1							
6. FFMQ-nonjudging	-.08	.32**	-.03	.26*	.33**	1						
7. FFMQ-nonreactivity	-.08	.17	.19	.40**	.26**	.14	1					
8. RSES-L	-.08	.49**	.20†	.58**	.46**	.50**	.20*	1				
9. Positive Mood Variability	.64**	-.25*	.10	.06	-.27**	-.05	-.12	.04	1			
10. Negative Mood Variability	.60**	-.32**	.04	-.03	-.36**	-.02	-.21*	-.14	.70**	1		
11. HUS – Hassles	-.00	-.12	-.01	-.24*	-.08	-.07	-.15	-.26**	-.10	.14	1	
12. HUS – Uplifts	-.31**	.14	.18†	.09	.18†	.09	-.02	.13	-.28**	-.14	.35*	1

Note. ** $p < 0.01$; * $p < 0.05$; † $p < 0.10$. MAAS = Mindful Attention Awareness Scale; FFMQ = Five Facet Mindfulness Questionnaire; RSES-L = Rosenberg Self-Esteem Scale – Level; HUS = Hassles and Uplifts Scale

Table 4. Summary of test statistics for Step 2 of the six hierarchical multiple regression analyses in which mindfulness is entered as a predictor of self-esteem stability controlling for covariate variables.

Predictor Variable	<i>B</i>	<i>SE B</i>	β	<i>t</i>	<i>p</i>	<i>R</i> ² change	<i>F</i> for <i>R</i> ² change
MAAS	.00	.34	.00	-.001	.99	< .001	< .001
FFMQ – observing	-.03	.04	-.05	-.67	.51	.003	.51
FFMQ – describing	-.07	.04	-.15	-1.65	.10	.02	2.73
FFMQ – awareness	.02	.05	.04	.46	.65	.001	.21
FFMQ – nonjudging	-.03	.04	-.08	-.87	.39	.004	.76
FFMQ – non-reactivity	.03	.05	.04	.50	.62	.001	.35

Note. ** $p < 0.01$; * $p < 0.05$; † $p < 0.10$. FFMQ = Five Facet Mindfulness. The table provides summary statistics for six, separate hierarchical multiple regression analyses. Test statistics are for the second step of hierarchical regression equations predicting self-esteem stability, with positive mood variability, negative mood variability, self-esteem level, hassles, and uplifts entered at the first step.

Table 5. Descriptive statistics for all measures with all participants ($N = 190$)

Measure	Mean	<i>SD</i>	Range	α
MAAS (S1)	3.47	.66	1.67-5.33	.80
MAAS (S2)	3.50	.74	1.53-5.73	.86
FFMQ – observing (S1)	26.24	5.30	9.00-38.00	.75
FFMQ – observing (S2)	25.74	6.07	9.00-39.00	.85
FFMQ – describing (S1)	25.22	6.21	10.00-40.00	.90
FFMQ – describing (S2)	25.84	5.50	8.00-40.00	.91
FFMQ – awareness (S1)	23.89	5.50	8.00-37.00	.87
FFMQ – awareness (S2)	24.13	5.79	12.00-39.00	.88
FFMQ – nonjudging (S1)	23.85	6.54	8.00-39.00	.89
FFMQ – nonjudging (S2)	24.55	6.90	8.00-40.00	.91
FFMQ – non-reactivity (S1)	20.04	3.95	10.00-32.00	.74
FFMQ – non-reactivity (S2)	20.03	4.22	7.00-33.00	.78
RSES-L (S1)	27.81	4.55	16.00-37.00	.77
RSES-L (S2)	29.54	4.94	13.00-37.00	.80
Self-Esteem Intability (10 day period)	5.11	2.42	0.32-11.94	-
Self-Esteem Intability (first five days of intervention)	4.93	2.26	0.42-13.35	-
Self-Esteem Stability (last five days of intervention)	4.42	2.92	.00-21.92	-
Positive Mood Variability (10 day period)	1.30	.48	0.23-2.66	-
Negative Mood Variability (10 day period)	1.24	.46	0.23-2.58	-
HUS – Hassles (S2)	38.62	19.65	2.00-90.00	.91

HUS – Uplifts (S2)	53.21	22.39	10.00-115.00	.91
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Note. *SD* = Standard Deviation; MAAS = Mindful Attention Awareness Scale; FFMQ = Five Facet Mindfulness Questionnaire; RSES-L = Rosenberg Self-Esteem Scale – Level; HUS = Hassles and Uplifts Scale; S1 = Session 1; S2 = Session 2.

Table 6. Means and standard deviations for self-esteem instability scores by time and condition

Condition	First Five days	Last Five Days
Mindfulness Training Condition	4.98 (.37)	4.44 (.42)
Cognitive Training Condition	4.15 (.39)	4.50 (.44)
Null Control Condition	5.26 (.27)	4.38 (.30)

Note. Mean scores are provided in plain text and standard errors are listed in parenthesis.

Figure 1. TMS-Curiosity in the mindfulness training and cognitive training conditions across time
Note. * $p < 0.05$; † $p < 0.10$

Figure 2. TMS-Decentering in the mindfulness training and cognitive training conditions across time

Note. * $p < 0.05$

Mindful Attention Awareness Scale
(Brown and Ryan, 2003)

Instructions: Below is a collection of statements about your everyday experience. Using the 1-6 scale below, please indicate how frequently or infrequently you currently have each experience. Please answer according to what *really reflects* your experience rather than what you think your experience should be. Please treat each item separately from every other item.

1	2	3	4	5	6
Almost Always	Very Frequently	Somewhat Frequently	Somewhat Infrequently	Very Infrequently	Almost Never

I could be experiencing some emotion and not be conscious of it until some time later.	1	2	3	4	5	6
I break or spill things because of carelessness, not paying attention, or thinking of something else.	1	2	3	4	5	6
I find it difficult to stay focused on what's happening in the present.	1	2	3	4	5	6
I tend to walk quickly to get where I'm going without paying attention to what I experience along the way.	1	2	3	4	5	6
I tend not to notice feelings of physical tension or discomfort until they really grab my attention.	1	2	3	4	5	6
I forget a person's name almost as soon as I've been told it for the first time.	1	2	3	4	5	6
It seems I am "running on automatic," without much awareness of what I'm doing.	1	2	3	4	5	6
I rush through activities without being really attentive to them.	1	2	3	4	5	6
I get so focused on the goal I want to achieve that I lose touch with what I'm doing right now to get there.	1	2	3	4	5	6
I do jobs or tasks automatically, without being aware of what I'm doing.	1	2	3	4	5	6
I find myself listening to someone with one ear, doing something else at the same time.	1	2	3	4	5	6
I drive places on "automatic pilot" and then wonder why I went there.	1	2	3	4	5	6

I find myself doing things without paying attention.	1	2	3	4	5	6
I snack without being aware that I'm eating.	1	2	3	4	5	6

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

1	2	3	4	5
Never or Rarely true	Rarely true	Sometimes true	often true	very often always true

- _____ 1. When I'm walking, I deliberately notice the sensations of my body moving.
- _____ 2. I'm good at finding words to describe my feelings.
- _____ 3. I criticize myself for having irrational or inappropriate emotions.
- _____ 4. I perceive my feelings and emotions without having to react to them.
- _____ 5. When I do things, my mind wanders off and I'm easily distracted.
- _____ 6. When I take a shower or bath, I stay alert to the sensations of water on my body.
- _____ 7. I can easily put my beliefs, opinions, and expectations into words.
- _____ 8. I don't pay attention to what I'm doing because I'm daydreaming, worrying, or otherwise distracted.
- _____ 9. I watch my feelings without getting lost in them.
- _____ 10. I tell myself I shouldn't be feeling the way I'm feeling.
- _____ 11. I notice how foods and drinks affect my thoughts, bodily sensations, and emotions.
- _____ 12. It's hard for me to find the words to describe what I'm thinking.
- _____ 13. I am easily distracted.
- _____ 14. I believe some of my thoughts are abnormal or bad and I shouldn't think that way.
- _____ 15. I pay attention to sensations, such as the wind in my hair or sun on my face.
- _____ 16. I have trouble thinking of the right words to express how I feel about things
- _____ 17. I make judgments about whether my thoughts are good or bad.
- _____ 18. I find it difficult to stay focused on what's happening in the present.
- _____ 19. When I have distressing thoughts or images, I "step back" and am aware of the thought or image without getting taken over by it.
- _____ 20. I pay attention to sounds, such as clocks ticking, birds chirping, or cars passing.
- _____ 21. In difficult situations, I can pause without immediately reacting.
- _____ 22. When I have a sensation in my body, it's difficult for me to describe it because I can't find the right words.
- _____ 23. It seems I am "running on automatic" without much awareness of what I'm doing.
- _____ 24. When I have distressing thoughts or images, I feel calm soon after.
- _____ 25. I tell myself that I shouldn't be thinking the way I'm thinking.
- _____ 26. I notice the smells and aromas of things.
- _____ 27. Even when I'm feeling terribly upset, I can find a way to put it into words.
- _____ 28. I rush through activities without being really attentive to them.
- _____ 29. When I have distressing thoughts or images I am able just to notice them without reacting.
- _____ 30. I think some of my emotions are bad or inappropriate and I shouldn't feel them.
- _____ 31. I notice visual elements in art or nature, such as colors, shapes, textures, or patterns of light and shadow.
- _____ 32. My natural tendency is to put my experiences into words.
- _____ 33. When I have distressing thoughts or images, I just notice them and let them go.
- _____ 34. I do jobs or tasks automatically without being aware of what I'm doing.
- _____ 35. When I have distressing thoughts or images, I judge myself as good or bad, depending

- _____ 37. I can usually describe how I feel at the moment in considerable detail.
- _____ 38. I find myself doing things without paying attention.
- _____ 39. I disapprove of myself when I have irrational ideas.

Instructions:

Below is a list of statements dealing with your general feelings about yourself. Please indicate how strongly you agree or disagree with each statement.

1. On the whole, I am satisfied with myself.

Strongly Agree Agree Disagree Strongly Disagree

2. At times I think I am no good at all.

Strongly Agree Agree Disagree Strongly Disagree

3. I feel that I have a number of good qualities.

Strongly Agree Agree Disagree Strongly Disagree

4. I am able to do things as well as most other people.

Strongly Agree Agree Disagree Strongly Disagree

5. I feel I do not have much to be proud of.

Strongly Agree Agree Disagree Strongly Disagree

6. I certainly feel useless at times.

Strongly Agree Agree Disagree Strongly Disagree

7. I feel that I'm a person of worth, at least on an equal plane with others.

Strongly Agree Agree Disagree Strongly Disagree

8. I wish I could have more respect for myself.

Strongly Agree Agree Disagree Strongly Disagree

9. All in all, I am inclined to feel that I am a failure.

Strongly Agree Agree Disagree Strongly Disagree

10. I take a positive attitude toward myself.

Strongly Agree Agree Disagree Strongly Disagree

Instructions:

Below is a list of statements dealing with your general feelings about yourself. Please indicate how strongly you agree or disagree with each statement. For these questions, answer in regards to **how you feel right now**.

1. On the whole, I am satisfied with myself.

1. Strongly Agree
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.
10. Strongly Disagree

2. At times I think I am no good at all.

1. Strongly Agree
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.
10. Strongly Disagree

3. I feel that I have a number of good qualities.

1. Strongly Agree
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.
10. Strongly Disagree

4. I am able to do things as well as most other people.

1. Strongly Agree
- 2.
- ~

- 5.
- 6.
- 7.
- 8.
- 9.
10. Strongly Disagree

5. I feel I do not have much to be proud of.

1. Strongly Agree
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.
10. Strongly Disagree

6. I certainly feel useless at times.

1. Strongly Agree
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.
10. Strongly Disagree

7. I feel that I'm a person of worth, at least on an equal plane with others.

1. Strongly Agree
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.
10. Strongly Disagree

8. I wish I could have more respect for myself.

1. Strongly Agree

- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.
10. Strongly Disagree

9. All in all, I am inclined to feel that I am a failure.

1. Strongly Agree
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.
10. Strongly Disagree

10. I take a positive attitude toward myself.

1. Strongly Agree
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.
10. Strongly Disagree

How positive are you feeling right now?

1	2	3	4	5	6	7
Not very						Very

How negative are you feeling right now?

1	2	3	4	5	6	7
Not very						Very

HASSLES are irritants—things that annoy or bother you; they can make you upset or angry. UPLIFTS are events that make you feel good; they can make you joyful, glad, or satisfied. Some hassles and uplifts occur on a fairly regular basis and others are relatively rare. Some have only a slight effect, others have a strong effect.

This questionnaire lists things that can be hassles and uplifts in day-to-day life. You will find that during the course of a day some of these things will have been only a hassle for you and some will have been only an uplift. *Others will have been both a hassle AND an uplift.*

DIRECTIONS: Please think about how much of a hassle and how much of an uplift each item was for you today. Please indicate on the left-hand side of the page (under “HASSLES”) how much of a hassle the item was by circling the appropriate number. Then indicate on the right-hand side of the page (under “UPLIFTS”) how much of an uplift it was for you by circling the appropriate number.

Remember, circle one number on the left-hand side of the page *and* one number on the right-hand side of the page for *each* item.

How much of a hassle was
this item for you today?

HASSLES

0 = None or not applicable
1 = Somewhat
2 = Quite a bit
3 = A great deal

How much of an uplift was
this item for you today?

UPLIFTS

0 = None or not applicable
1 = Somewhat
2 = Quite a bit
3 = A great deal

DIRECTIONS: Please circle one number on the left-hand side *and* one number on the right-hand side for each item.

0 1 2 3	1.	Your child(ren)	0 1 2 3
0 1 2 3	2.	Your parents or parents-in-law	0 1 2 3
0 1 2 3	3.	Other relative(s)	0 1 2 3
0 1 2 3	4.	Your spouse	0 1 2 3
0 1 2 3	5.	Time spent with family	0 1 2 3
0 1 2 3	6.	Health or well-being of a family member	0 1 2 3
0 1 2 3	7.	Sex	0 1 2 3
0 1 2 3	8.	Intimacy	0 1 2 3
0 1 2 3	9.	Family-related obligations	0 1 2 3
0 1 2 3	10.	Your friend(s)	0 1 2 3
0 1 2 3	11.	Fellow workers	0 1 2 3
0 1 2 3	12.	Clients, customers, patients, etc.	0 1 2 3
0 1 2 3	13.	Your supervisor or employer	0 1 2 3
0 1 2 3	14.	The nature of your work	0 1 2 3
0 1 2 3	15.	Your work load	0 1 2 3
0 1 2 3	16.	Your job security	0 1 2 3
0 1 2 3	17.	Meeting deadlines or goals on the job	0 1 2 3
0 1 2 3	18.	Enough money for necessities (e.g., food, clothing, housing, health care, taxes, insurance)	0 1 2 3

0 1 2 3	19.	Enough money for education	0 1 2 3
0 1 2 3	20.	Enough money for emergencies	0 1 2 3
0 1 2 3	21.	Enough money for extras (e.g., entertainment, recreation, vacations)	0 1 2 3
0 1 2 3	22.	Financial care for someone who doesn't live with you	0 1 2 3
0 1 2 3	23.	Investments	0 1 2 3
0 1 2 3	24.	Your smoking	0 1 2 3
0 1 2 3	25.	Your drinking	0 1 2 3
0 1 2 3	26.	Mood-altering drugs	0 1 2 3
0 1 2 3	27.	Your physical appearance	0 1 2 3
0 1 2 3	28.	Contraception	0 1 2 3
0 1 2 3	29.	Exercise(s)	0 1 2 3
0 1 2 3	30.	Your medical care	0 1 2 3
0 1 2 3	31.	Your health	0 1 2 3
0 1 2 3	32.	Your physical abilities	0 1 2 3
0 1 2 3	33.	The weather	0 1 2 3
0 1 2 3	34.	News events	0 1 2 3
0 1 2 3	35.	Your environment (e.g., quality of air, noise level, greenery)	0 1 2 3
0 1 2 3	36.	Political or social issues	0 1 2 3
0 1 2 3	37.	Your neighbourhood (e.g., neighbours, setting)	0 1 2 3
0 1 2 3	38.	Conserving (gas, electricity, water, gasoline, etc.)	0 1 2 3
0 1 2 3	39.	Pets	0 1 2 3
0 1 2 3	40.	Cooking	0 1 2 3
0 1 2 3	41.	Housework	0 1 2 3
0 1 2 3	42.	Home repairs	0 1 2 3
0 1 2 3	43.	Yardwork	0 1 2 3
0 1 2 3	44.	Car maintenance	0 1 2 3
0 1 2 3	45.	Taking care of paperwork (e.g., paying bills, filling out forms)	0 1 2 3
0 1 2 3	46.	Home entertainment (e.g., TV, music, reading)	0 1 2 3
0 1 2 3	47.	Amount of free time	0 1 2 3
0 1 2 3	48.	Recreation and entertainment outside the home (e.g., movies, sports, eating out, walking)	0 1 2 3
0 1 2 3	49.	Eating (at home)	0 1 2 3
0 1 2 3	50.	Church or community organizations	0 1 2 3
0 1 2 3	51.	Legal matters	0 1 2 3
0 1 2 3	52.	Being organized	0 1 2 3
0 1 2 3	53.	Social commitments	0 1 2 3

Demographics Questions

Gender:

Man
Woman
Transgender man
Transgender woman
Other _____

Age: _____

Year in College:

Freshman
Sophomore
Junior
Senior
Other: _____

Sexual orientation:

Straight/Heterosexual
Lesbian/Homosexual Female
Gay/Homosexual Male
Bi-sexual
Other _____

Political orientation:

Very conservative
Conservative
Moderate
Liberal
Very liberal

What political party best represents your beliefs?

___ Democrat ___ Republican ___ Libertarian ___ Independent ___ Other

Marital Status:

_____ Single
_____ Married
_____ Separated
_____ Divorced
_____ Widowed

Ethnicity:

_____ White/Caucasian
_____ Hispanic/Latino(a)

☐ African-American/Black
☐ Asian
☐ Native American
☐ Other – Please list: _____

What is your religious affiliation:

☐ Christian ☐ Muslim
☐ Jewish
☐ Hindu ☐ Atheist
☐ Buddhist ☐ Agnostic
☐ Not religious ☐ Other – Please list: _____

What is your family income?

☐ Less than \$10,000
☐ \$10,000 to \$19,999
☐ \$20,000 to \$29,999
☐ \$30,000 to \$39,999
☐ \$40,000 to \$49,999
☐ \$50,000 to \$59,999
☐ \$60,000 to \$69,999
☐ \$70,000 to \$79,999
☐ \$80,000 to \$89,999
☐ \$90,000 to \$99,999
☐ \$100,000 to \$149,999
☐ \$150,000 or more

How would you characterize your hometown?

☐ rural (unincorporated)
☐ small town (village or town)
☐ suburban (metropolitan area of a large city)
☐ small city (population < 30,000)
☐ medium-sized city (population 30,000 – 100,000)
☐ large city (population > 100,000)

Please list all psychology courses that you have taken.

Have you ever:

Practiced meditation regularly Y/N

Practiced yoga regularly Y/N

Practiced Tai Chi regularly. Y/N

Practiced martial arts regularly Y/N

Used the app called “Headspace” Y/N

Toronto Mindfulness Scale
(Lau et al., 2006)

Instructions: We are interested in what you just experienced. Below is a list of things that people sometimes experience. Please read each statement. Please indicate the extent to which you agree with each statement. In other words, how well does the statement describe what you just experienced, just now?

1. I experienced myself as separate from my changing thoughts and feelings.
2. I was more concerned with being open to my experiences than controlling or changing them.
3. I was curious about what I might learn about myself by taking notice of how I react to certain thoughts, feelings, or sensations.
4. I experienced my thoughts more as events in my mind than as a necessarily accurate reflection of the way things 'really' are.
5. I was curious to see what my mind was up to from moment to moment.
6. I was curious about each of the thoughts and feelings that I was having.
7. I was receptive to observing unpleasant thoughts and feelings without interfering with them.
8. I was more invested in just watching my experiences as they arose, than in figuring out what they could mean.
9. I approached each experience by trying to accept it, no matter whether it was pleasant or unpleasant.
10. I remained curious about the nature of each experience as it arose.
11. I was aware of my thoughts and feelings without overidentifying with them.
12. I was curious about my reactions to things.
13. I was curious about what I might learn about myself by just taking notice of what my attention gets drawn to.