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**DOES DECENTERING MEDIATE THE RELATIONSHIP BETWEEN  
MINDFULNESS AND STRESS AND ANXIETY?**

by

Hana Hannah Lee

A Thesis

Submitted to the  
Department of Psychology  
College Science and Mathematics  
In partial fulfillment of the requirement  
For the degree of  
Master of Arts in Clinical Psychology  
at  
Rowan University  
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Thesis Advisor: Jeffrey Greeson, Ph.D

Committee Members:  
Meredith Jones, Ph.D  
Steven Brunwasser, Ph.D

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## **Dedication**

I would like to dedicate this manuscript to my dear parents, Young Ok and Yong Ho for supporting me through this journey and gifting me with their wisdom and guidance in life. I would also like to thank my grandparents, Sung and Chun Taek for their continuous blessings, prayers, and unconditional love.

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## Abstract

Hana Lee

### DOES DECENTERING MEDIATE THE RELATIONSHIP BETWEEN MINDFULNESS AND STRESS AND ANXIETY?

2020-2021

Jeffrey Greeson, Ph.D

Master of Arts in Clinical Psychology

College students are stressed and unsuccessful efforts to cope can increase risk for poor mental health, including anxiety (American College Health, 2019). Research suggests mindfulness (Bamber & Schneider, 2016) and adaptive emotion regulation (Desrosiers et al. 2013b) can buffer against the deleterious effects of distress. Decentering, a mindful emotion regulation strategy (Chambers et al., 2009), is postulated to be a mechanism by which mindfulness can lead to better mental health (Shapiro et al. 2006). Specific facets of trait mindfulness, namely Nonjudging (NJ) and Nonreactivity (NR) (Mizera et al. 2016), are directly involved in regulating one's emotions, which can help reduce levels of stress and anxiety. Using data from a cross-sectional survey study of 534 college students, the present study investigated whether decentering can mediate the relationship between mindfulness and stress and anxiety, while controlling for gender, race, and previous meditation experience. I hypothesized that facets of trait mindfulness, specifically NJ and NR, will have a negative indirect effect on stress and anxiety through decentering. I expected trait mindfulness to have a positive effect on decentering which will in turn have a negative effect on distress. Results showed that decentering mediated the relationship between NJ and NR on one hand, and stress and anxiety on the other. Findings support decentering as a mindful emotion regulation mechanism. Cultivating NJ and NR through practice can help facilitate decentering and thereby reduce distress.

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## **Chapter 1**

### **Introduction**

College students experience considerable stress, which can in turn affect their mental health (American College Health Association National College Health Assessment, 2019). Some stressors that college students commonly face can be attributed to learning to live independently, obtaining good grades, establishing new relationships, and financial pressures (Hurst, Baranik, & Daniel, 2013). A 2019 national survey (American College Health Association National College Health Assessment) of college students, found that within the past 12 months, 87% of students reported they “felt overwhelmed by all [they] had to do” and 66% “felt overwhelming anxiety.” Many students report difficulties coping with stress and can learn to engage in unhealthy emotion regulation strategies such as avoiding the stressor, catastrophizing, worrying, and perseverating about it, all of which are associated with more stress and stress-related disorders, like increased risk for anxiety (Zivin, Eisenbeg, Gollust, & Golberstein, 2009). Research suggests that mindfulness might be one way to mitigate distress by cultivating the use of more adaptive emotion regulation skills.

### **Mindfulness**

Mindfulness is often defined as paying attention to the present moment, nonjudgmentally and nonreactively (Kabat-Zinn, 1990). Although the definition of mindfulness has varied over the years, many agree that the core components of mindfulness includes awareness and acceptance of the present moment (Germer, 2005; Bishop et al. 2004; Lindsay & Crewell, 2017). Mindfulness is also operationalized in several different ways. It is conceptualized as a trait, state, and a training. Trait

mindfulness is innate and refers to a disposition to be mindful in one's daily life and is usually stable over time (Baer et al. 2006), whereas state mindfulness is practiced and cultivated through mindfulness meditation (Lau et al. 2006). State mindfulness can be increased in the moment after meditation practice. Mindfulness training, such as mindfulness-based stress reduction (MBSR) and mindfulness-based cognitive therapy (MBCT) are usually formatted to be 8 to 10-week long programs designed to teach core mindfulness skills, such as the ability to monitor present moment experiences openly with acceptance and compassion, which have been shown to reduce a variety of problems related to stress (Bamber & Schneider, 2016; Creswell, 2017; Hofmann & Gomez, 2017; Querstret, Cropley, & Fife-Schaw, 2018; Baer, 2006), such as anxiety, depression, pain and other mental and physical health concerns. Repeated mindfulness meditation practice through training is said to cultivate greater levels of state mindfulness, and over time, increases in trait mindfulness (Kiken, Garland, Bluth, Palsson, & Gaylord, 2015).

### **Measures and Facets of Mindfulness**

Self-reports can capture one's propensity to be mindful in their daily life. Early efforts to measure mindfulness using self-reports have supported it as a unidimensional construct (Brown & Ryan, 2003). The Mindful Attention Awareness Scale (MAAS; Brown & Ryan, 2003), Freiburg Mindfulness Inventory (FMI; Walach, Buchheld, Buttenmuller, Kleinknecht, & Schmidt, 2006), Cognitive and Affective Mindfulness Scale—Revised (CAMS-R; Feldman, Hayes, Kumar, Greeson, & Laurenceau, 2007), and Southampton Mindfulness Questionnaire (SMQ; Chadwick et al., 2008) are all common instruments used to measure mindfulness as a unitary construct.

However, over time, mindfulness has been operationalized as a multifaceted construct, that mindfulness consists of more than one mindfulness skill. The Kentucky Inventory of Mindfulness Skills (KIMS; Baer, Smith, & Allen, 2004), Five Facet Mindfulness Questionnaire (FFMQ; Baer et al., 2006), Philadelphia Mindfulness Scale (PHLMS; Cardaciotto, Herbert, Forman, Moitra, & Farrow, 2008), and Toronto Mindfulness Scale (TMS; Lau et al., 2006; TMS-Trait Version: Davis, Lau, & Cairns, 2009) all support mindfulness as a multidimensional construct. Researchers have argued that mindfulness as a unidimensional construct is an oversimplified (Grossman, 2011) and underrepresented (Baer et al. 2006) way to measure mindfulness (Rau & Williams, 2016). For example, Baer, Smith, Lykins, Button, Krietemeyer, Sauer, Walshm Duggan, and Williams (2008) posit that is essential to study mindfulness at each facet level to better understand which skills are cultivated during mindfulness and how they relate to better mental and physical health.

One of the most widely used multidimensional measure of mindfulness is the FFMQ (Baer et al. 2006). In this measure, mindfulness is conceptualized as encompassing five independent factors, which reflect the core qualities of mindfulness, for example, attention, awareness, openness, and acceptance: (1) Observing or noticing different experiences, such as sensations, thoughts, emotions, sights, sounds, and smells, whether pleasant or unpleasant; (2) Describing internal and external experiences with a label; (3) Acting with Awareness by attending to activities with present moment awareness instead of being on auto-pilot mode; (4) Nonjudging or not evaluating inner experiences, such as thoughts, feelings, or emotions as bad, unpleasant, inappropriate, or harmful, rather reminding oneself that they are natural occurrences; and (5) Nonreacting

to inner experiences by allowing thoughts and emotions to freely come and go without getting carried away by the intensity of them. These facets of mindfulness are interrelated, and all measure the given construct- mindfulness, specifically, the capacity to attend to present moment experiences in an open, curious, and accepting way, but examining each facet independently allows one to explore how certain skills impacts well-being, such as better mental health, in different ways.

### **Dispositional Mindfulness and its Mental Health Benefits**

Formal mindfulness training is associated with mental health benefits (McClintock, Rodriguez, & Zerubavel, 2019; Jayawardene, Lohrmann, Erbe, & Torabi, 2017; Parsons, Crane, Parsons, Fjorback, & Kuyken, 2017; Hofmann, Sawyer, Witt, & Oh, 2010; Khoury, Sharma, Rush, & Fournier, 2015; Grossman, Niemann, Schmidt, & Walach, 2004) and its treatment gains are maintained long term (Solhaug, de Vibe, Friberg, Sorlie, Tyssen, Bjorndal, & Rosenvinge, 2019; de Vibe, Solhaug, Rosenvinge, Tyssen, Hanley, & Garland, 2018; McIndoo, File, Preddy, Clark, & Hopko, 2016). However, research also suggests that individuals with greater dispositional mindfulness report better mental health (Tomlinson, Yousaf, Vitterso, & Jones, 2018) irrespective of not having prior mindfulness experience. More specifically, higher trait mindfulness is linked with better emotion regulation (Heppner, Spears, Vidrine, Wetter, 2015; Feldman et al. 2007; Baer et al., 2008) and less stress (Zimmaro et al., 2016) and anxiety (Brown & Ryan, 2003) even in a sample of college students without known mindfulness experience (Bodenlos, Wells, Noonan, & Mayrsohn, 2015) and some mindfulness experience (Karing, Oeltjen, & Beelmann, 2021; Medvedev, Norden, Krageloh, & Siegert, 2018). This is because individuals who are more mindful, are more aware and

accepting of their experiences, therefore less likely to view and appraise an unpleasant situation as negative (Lindsay & Crewell, 2017). On the other hand, lower levels of trait mindfulness are associated with higher levels of anxiety, because if an individual is not mindful and not aware of the present moment, they attend to past or future events, and begin to internalize and evaluate their experiences in a judgmental way and sometimes choose to avoid (Roemer, Lee, Salters-Pedneault, Erisman, Orsillo, & Mennin, 2009), thus perpetuating an intense cycle of worry and increased anxiety.

### **The Role of Specific Mindfulness Facets (Nonjudging and Nonreactivity) in Reducing Distress**

Mindful emotion regulation is one theoretical framework to understand how mindfulness works (Chambers et al. 2009). Chambers et al. (2009) argued that specific facets of mindfulness through mindfulness meditation can help to facilitate increased awareness, better attention, and use of more adaptive emotion regulation strategies, which can promote better mental health by allowing individuals to view their internal experiences from a different lens. For example, Chambers et al. (2009) posit that one facet in particular, Nonjudging allows individuals to have a healthy relationship with their negative emotions which might otherwise be considered unpleasant or uncomfortable by many. Chambers et al. (2009) specifically states that the process of Nonjudging provides individuals with the opportunity to experience their negative emotions less evaluatively by teaching more adaptive ways to respond, which is linked with less psychological distress (Feldner et al. 2003).

One example of Nonjudging is when highly stressed individuals experience high levels of anxiety and have a propensity to experience negative emotions, thoughts, or

sensations. The goal of Nonjudging is to remind individuals to not label, evaluate, or judge these difficult experiences as bad, inappropriate, or unacceptable. Instead, they are told to notice them and not change them. By taking a nonevaluative stance and allowing and accepting the unpleasant thoughts, feelings, and sensations as they are, individuals are better able to see things as they exist, and the unpleasant experiences are viewed less distressing when they come and go. Further, individuals who are more mindful through more Nonjudging, are less likely to avoid negative emotional states, and more likely to be open to negative feelings and report better mental health (MacDonald & Baxter, 2017) because they learn to view these uncomfortable experiences as transient mental events that do not always require one to immediately act upon the experience by changing it or avoiding it. Moreover, individuals who do not judge their negative experiences, are more likely to accept them as they are and report these experiences as less negative and less intense (Ford, Lam, John, & Mauss, 2018), thereby mitigating levels of stress and anxiety. In line with this, a cross-sectional study with a nonclinical sample (Cash & Whittingham, 2010) found that higher levels of Nonjudging was the only facet related to lower levels of both stress and anxiety.

Nonreactivity, is another facet of interest also strongly linked with less stress and anxiety. Previous findings continue to support that lower levels of Nonreactivity is linked with increased distress, specifically more worrying which is a hallmark feature of stress and anxiety (Baker et al. 2019; Curtiss & Klemanski, 2014; Hoge et al. 2015).

Nonreactivity cultivates core mindfulness values which teaches individuals to notice distressing thoughts or images, let them be, and accept them as they are because they are a natural occurrence (Lindsay & Creswell, 2017; Ford, Lam, John, & Mauss, 2018).



When people are mindfully aware and less reactive, they learn to “let go” and they are less likely to engage in the automatic, maladaptive emotion regulation strategies, such as avoidance or suppression, in an effort to control their unpleasant inner experience (Greeson, Garland, & Black, 2014), which is beneficial in reducing the repetitive, negative processes involved in anxiety, such as worry and rumination. Furthermore, Nonreactivity teaches individuals to approach negative experiences with open curiosity and interest, therefore allowing one to less likely experience the associated physiological and emotional reactivity (Bergeron, Almgren-Dore, & Dandeneau, 2016) that accompanies an upsetting experience, such as worrying, and thereby feel less stressed and anxious.

Nonjudging and Nonreactivity help people who automatically react to a distressing event or inner experiences, learn how to relate to their experience differently, in healthier ways, so they can better self-regulate emotions, stress, and anxiety, for example (Greeson & Brantley, 2009). The two facets are fundamental in facilitating openness to negative emotions and engenders values like acceptance (Lindsay & Creswell, 2017) which may be beneficial in mitigating chronic worrying and anxiety (Emerson, Heapy, & Garcia-Soriano, 2018) by aiding individuals to disengage in the maladaptive thoughts and allowing flexibility in responding to the emotional situation (Wells, 2002). Nonjudging allows individuals to view their experience as less negative, whereas Nonreactivity reminds individuals to notice the distressing emotions without reacting to it and accepting the situation as it is, so one is less engaged in altering a negative situation by controlling or avoiding it. Research has found that avoiding negative emotional states has been linked with greater psychological distress (Feldner et

al. 2003). Therefore, individuals who are more mindful by Nonjudging and Nonreacting, are more likely to be open to negative feelings and report better mental health (MacDonald & Baxter, 2017; Mizera et al. 2016) because they are less critical of their experiences and can more easily disengage from the automatic, unhelpful responses to difficult situations. This is consistent with past studies which have found that Nonjudging (Cash & Whittingham, 2010) and Nonreactivity (Desrosiers, Klemanski, & Nolen-Hoeksema, 2013; Brown et al. 2015) are two important facets of mindfulness in predicting better psychological health (Baer et al. 2008), specifically, more Nonjudging and Nonreactivity has been robustly linked with less anxiety (Mizera, Bolin, Nugent, & Strand, 2016; Garland, Tamagawa, Todd, Speca, & Carlson, 2013; Baker et al. 2019; Curtiss & Klemanski, 2014; Hoge et al. 2015; Fisak & Von Lehe, 2012).

There are other facets that comprise the construct trait mindfulness, such as Observing, Describing, and Acting with Awareness, however these facets are not equally important when it comes to explaining its benefits on treating anxiety (Hedman, Hesser, Andersson, Axelsson, & Ljotsson, 2017). For example, items on the FFMQ-15, such as “When I take a shower or bath, I stay alert to the sensations of water on my body” (Observing), “I’m good at finding words to describe my feelings” (Describing), and “I do jobs or tasks automatically without being aware of what I’m doing” (Acting with Awareness) has little to no relevance in the context of explaining how one can use these mindfulness skills to reduce their stress and anxiety levels. Additionally, the purported associations between facets, such as observing and describing on mental health have been mixed (MacDonald & Olsen, 2020; Baer et al. 2006; Desrosiers et al. 2013a; Garland et al. 2013). For instance, in some studies the observing facet was associated with higher

levels of anxiety (Desrosiers et al. 2013a), but lower levels of anxiety in others (Garland et al. 2013), and in one study (Brown et al. 2015) it was not significantly associated with anxiety. However, research has found that Nonjudging (Fisak & Von Lehe, 2012; Cash & Whittingham, 2010) and Nonreactivity (Desrosiers, Klemanski, & Nolen-Hoeksema, 2013; Hedman, Hesser, Andersson, Axelsson, & Ljotsson, 2017) are well-documented and are the most important mindfulness facets in predicting less stress and anxiety in clinical and non-clinical adult samples, and even among college students (Brown et al. 2015; MacDonald & Olsen, 2020). That is because individuals who exhibit higher levels of Nonjudging and Nonreactivity are less likely to notice their worries as harmful and judge them, thus feel less compelled to react to the situation, which reduces the tendency to feel aroused in response to the worrying when it happens, thereby allowing one to flexibly focus on the present moment because they realize the anxious moment will soon pass, which can protect against symptoms of anxiety. Therefore, the present study focuses on the Nonjudging and Nonreactivity facets.

### **Emotion Regulation: A Plausible Link between Mindfulness and Mental Health?**

Emotion regulation is an individual's ability to monitor and modulate emotions in response to different situational demands, including stress (Gross & Thompson, 2007). People can cope and adapt to stressors by utilizing adaptive or maladaptive emotion regulation strategies. Healthy emotion regulation strategies, such as orienting/allowing, reappraisal/reframing, distancing/decentering are linked with high trait mindfulness, whereas maladaptive emotion regulation strategies, such as worry and rumination are linked with lower levels of trait mindfulness (Desrosiers et al. 2013b; Hill & Updegraff, 2012) and in consequence, poorer mental health.

Adaptive emotion regulation shares similarities with mindfulness in that there is an emphasis on not immediately reacting to a situation, instead, being mindfully aware of the present moment, so one does not act on the urgency of the emotional response (Kring & Sloan, 2009). Erisman and Roemer (2010) have found that mindfulness training can help to improve emotion regulation by cultivating more emotional awareness. Emotional awareness can lead to more openness, curiosity, and acceptance of one's internal experiences which allows one to behave more flexibly instead of impulsively, which is said to promote mental health (Freudenthaler, Turba, & Tan, 2017; Bishop et al. 2004).

Moreover, research suggests that being more mindful (trait mindfulness) is associated with less difficulties with emotion regulation (Hill & Updegraff, 2012; Roemer et al. 2009) and diminished physiological response to stress (Arch & Craske, 2010). However, the process in which practicing mindfulness aids in regulating emotions is equivocal and there is no consensus in regards to whether mindfulness is a top-down (Garland, Gaylord, & Park, 2009) or a bottom-up (Chambers et al. 2009) emotion regulation strategy (Chiesa, Serretti, Jakobsen, 2013) because there is no agreement on how to properly define and conceptualize the different emotion regulation strategies (Gross, 1998; Chiesa et al. 2013). For example, whereas cognitive reappraisal involves, the act of reinterpreting/changing the way one thinks about an emotion stimuli as a top-down process (Garland, Farb, Goldin, & Fredrickson, 2016; Chiesa et al. 2013), "mindful emotion regulation" (Chambers et al. 2009) involves a bottom-up process of "non-evaluative" awareness and acceptance of emotional states, without having to change them in the moment (Reive, 2019). A recent review of neuroimaging studies (Guendelman, Medeiros, Rampes, 2017) found that mindfulness as a practice and training can induce a

top-down emotion regulation process (cognition-driven) and a bottom-up process (affect-driven) as evidenced by changes observed in brain areas corresponding to both regulatory strategies, specifically the medial prefrontal cortex and the lateral prefrontal cortex which involves a top-down emotion regulation process and changes in bottom-up emotion regulation systems, such as the amygdala, auditory cortex, and the subgenual anterior cingulate cortex. One explanation for this is that different mindfulness-based practices (e.g. attention focused- top-down vs. bodily focused-bottom-up) can evoke different emotional states and regulatory mechanisms (Guendelman et al. 2017; Nakamura, Tawatsuji, Fang, & Matsui, 2021). Irrespective of these differences, many agree that there is a relationship between different emotion regulation strategies and mindfulness (Iani, Lauriola, Chiesa, & Cafaro, 2019) and both share commonalities because the pathway in which mindfulness training leads to improved emotion regulation, whether a top-down or bottom-up process, both involve awareness and acceptance (Guendelman et al. 2017).

### **Decentering (Mindful Emotion Regulation)**

One putative mindful emotion regulation strategy (Greeson & Brantley, 2009; Shapiro et al., 2006; Chambers et al., 2009), decentering, is postulated to be a key mechanism in which mindfulness can lead to better mental health (Hayes-Skelton & Graham, 2013; Shapiro et al. 2006). Decentering is the ability to adopt a “fly on the wall” perspective on one’s internal experiences (e.g. unpleasant thoughts, memories, emotions, and urges), so they are perceived from a distance, instead of accurate, permanent, representations of the self (Fresco et al. 2007). For example, seeing these events unfold as an “observer” or “third-party” promotes a greater sense of clarity and allows one to step

back from the intensity of the experience. The process of decentering includes three psychological processes: *meta-awareness* of the present experience, *disidentification from internal experience* so they are separate from one's self, and *reduced reactivity to thought content* (Bernstein et al. 2015; Bernstein et al. 2019).

The theoretical concept of decentering overlaps with mindfulness constructs in that mindfulness facilitates present-moment awareness, "self-regulation of attention" (Bishop et al. 2004), and a "fundamental shift in perspective," also known as *reperceiving* (Carmody, Baer, Lykins, Olendzki, 2009). *Reperceiving* is often used synonymously with terms like "decentering" and "distancing" (Carmody et al. 2009; Greeson & Brantley, 2009), hence decentering is commonly referred to as a mindfulness-related construct (Bernstein et al. 2015). Relatedly, previous studies (Carmody et al. 2009; Tanay, Lotan, & Bernstein, 2012) have found that increases in both dispositional and state mindfulness are associated with increases in disidentification from internal experiences on the Experiences Questionnaire (EQ; Fresco et al. 2007), a measure of decentering, further elucidating that the metacognitive processes that occur in decentering are directly related to mindfulness as a trait, state, and training. Consistent with this thought that decentering is related to mindfulness, Carmody, Baer, Lykins, and Olendzki (2009) extended Shapiro and colleagues' (2006) work. Shapiro and colleagues (2006) proposed a model suggesting that increases in mindfulness during Mindfulness-Based Interventions (MBIs) lead to more decentering, which will improve four domains: 1) Change in self-regulation, 2) Change in values, 3) Change in flexibility, and 4) Change in exposure, which leads to better mental health. However, Carmody et al. (2009) found that with a community sample enrolled in a mindfulness program, changes in decentering did not necessarily

improve the four mediators that Shapiro et al. (2006) reported. The patterns of findings were similar even after testing an alternative model in which decentering was the predictor variable and mindfulness was the mediator, implying that a sequential model did not apply for the proposed mediation model (Carmody et al. 2009). Therefore, when Carmody et al. (2009) combined the scores of Observing, Nonjudging, and Nonreactivity scales on the FFMQ (trait mindfulness) to obtain a total mindfulness score, he found that scores on the FFMQ (trait mindfulness) and EQ (decentering) was collinear. Pearson's correlation showed the two variables were strongly correlated (Carmody et al. 2009). It was only after when Carmody et al. (2009) aggregated scores on the two measures together, he found that there was partial support for improvements on the mediator variables, which led to reductions in psychological distress. More specifically, it was the four variables that partly mediated (not decentering) the relationship between a composite mindfulness and decentering score and psychological health (Carmody et al. 2009). This suggests that mindfulness and decentering are highly overlapping constructs, thus mindfulness training and practice can simultaneously improve mindfulness and decentering scores, thereby increase scores on the four mediator variables (changes in self-regulation, values, flexibility, and exposure), which leads to better mental health, more specifically reductions in psychological symptoms and less stress. Carmody et al. (2009)'s study found that mindfulness and decentering constructs are highly correlated, thus warrants further investigation as whether they are similar constructs and should be combined because differences between the two studies, such as the sample characteristics and the measures used to assess these specific constructs can result in different findings.

## **Mindfulness vs. Decentering Distinctions**

Some researchers believe that the two constructs, mindfulness and decentering, should be separated because there are key distinctions between them (Hayes-Skelton, & Graham, 2013; Shapiro et al. 2006). Although mindfulness involves components of decentering, specifically processes like meta-awareness, decentering is a discrete “mechanism of action” (Bernstein et al. 2015). Mindfulness specifically refers to the deliberate cultivation of present moment awareness and adopting a Nonjudgmental and Nonreactive stance towards one’s experiences, whereas decentering is a feature of mindfulness that refers to the process of taking a “psychologically distanced stance” (Hoge et al. 2015), a shift in awareness that allows for flexibility of more adaptive responses to a distressing situation. Decentering allows one to distance oneself from their internal experience (thought, feeling, or sensation) so one is less engaged in responding to intensity of the thought, feeling, or sensation because they come to recognize that their experiences are temporary mental objects that is separate from the self (Hoge et al. 2015). The focus of decentering is to teach people to shift in perspective by seeing one’s mental event, such as thoughts, merely just as thoughts and nothing more. This process changes how one relates to self and their inner experiences.

Further, mindfulness and decentering are different in that, Shapiro et al. (2006) proposes that for one to be able to decenter, one needs to first cultivate mindfulness. Specifically, mindfulness training increases the ability to distance oneself from their mental events. Mindfulness includes awareness of the present moment and involves an attitudinal component- acceptance or nonjudgment towards one’s experiences (Feldman et al. 2007). There is a focus on acknowledging one’s experiences as temporary events



and willingness to experience the emotions without acting upon them (Feldman et al. 2007; Kabat-Zinn, 1990). And, specific facets of mindfulness teaches one to take a Nonjudgmental stance towards their inner experiences, and allows one to respond flexibly, instead of automatically (Nonreactive) to stressful events and experiences (Feldman et al. 2007; Kabat-Zinn, 1990). When one is mindfully aware, specifically by learning to be Nonjudgmental and Nonreactive to their experiences, it becomes easier to deidentify and distance (decenter) themselves from their thoughts and emotions, which is related to better mental health (Kessel, Gecht, Formann, Drueke, Gauggel, & Mainz, 2016). Relatedly, an experimental study (Erisman & Roemer, 2010) found that decentering scores increased following a brief mindfulness training. This finding helps substantiate the claim that mindfulness practice leads to increases in decentering, further positing that decentering works as a mediator of mindfulness (Hoge et al. 2015; Shapiro et al. 2006; Gecht et al. 2014; Hayes-Skelton & Graham, 2013) to promote better mental health. Findings from these studies suggest that although mindfulness and decentering may share overlapping themes, such as awareness of one's internal experiences, the two constructs should not be combined, rather looked at separately.

### **Emotion Regulation as a Potential Mediator between Mindfulness and Distress**

Despite the burgeoning popularity of mindfulness in the field of psychology, although research supports that high trait mindfulness is negatively correlated with psychological distress and anxiety (Enkema, McClain, Bird, Halvorson, & Larimer, 2020; Brown & Ryan, 2003; Cash and Whittingham, 2010), the mechanisms by which mindfulness leads to positive health outcomes, such as lower levels of stress and anxiety symptoms still remains unclear (Enkema et al. 2020; Sauer & Baer, 2010).

Previous cross-sectional and experimental/intervention studies that explored emotion regulation as a mechanism to potentially explain the link between mindfulness and distress have been inconsistent. For example, some studies found that emotion regulation can partly explain the relationship between mindfulness and psychological well-being in both clinical samples (Diehl, McGonigal, Morgan, Dalrymple, Harris, Chelminski, & Zimmerman, 2020; Gu, Strauss, Bond, & Cavanagh, 2015) and healthy samples (Cheung & Ng, 2019; Burzler, Voracek, Hos & Tran, 2019; Ma & Fang, 2019; Freudenthaler, Turba, & Tran, 2017; MacDonald & Baxter, 2017). In particular, some cross-sectional survey studies (Burzler et al. 2019; Freudenthaler et al. 2017) found that emotion regulation can partly explain the relationship between being more mindful and less depressed and anxious in a sample of healthy individuals without prior meditation experience. In line with these findings, Coffey and Hartman (2008) found that emotion regulation (assessed by the Repair subscale from the Trait Meta-Mood Scale; Salovey, Mayer, Goldman, Turvey, & Palfai, 1995) mediated the relationship between a unidimensional measure of mindfulness (Mindful Attention Awareness Scale [MAAS]; Brown & Ryan, 2003) and psychological distress, such as depression and anxiety among a nonclinical sample of undergraduates. Prakash, Hussain, and Schirda (2015) also found that emotion regulation (DERS; Gratz & Roemer, 2004) mediated the relationship between mindfulness (assessed with the MAAS, a unidimensional measure of mindfulness) and perceived stress (PSS; Cohen, Kamarck, & Mermelstein, 1983) in a healthy sample of older (ages 60-80 years old) and younger (18-30 years old) adults. Further, one study found that specific emotion regulation strategies operate differently to explain the link between mindfulness and psychological distress, namely, anxiety and

depression (Desrosiers et al. 2013b). In this study (Desrosiers et al. 2013b), worry mediated the associations between mindfulness and anxiety, whereas rumination and reappraisal mediated the associations between mindfulness and depression. These findings, however, were not supported in an observational, pre-post MBSR intervention study with a community sample (Carmody et al. 2009), such that improvements in mindfulness did not lead to improvements in emotion regulation scores, specifically decentering, and thereby reductions in psychological symptoms. The inconsistent findings can partly be due to the inherent difficulties capturing these constructs using self-reports, since constructs such as mindfulness have been operationalized differently (Baer et al. 2004; Davidson & Kaszniak, 2015; Bednar, Voracek, & Tran, 2020). Also, different mindfulness and emotion regulation self-report measures being used in different studies can become problematic especially if the measures being used to conceptualize the constructs are being assessed in different ways (Bhambhani & Cabral, 2016). For example, Carmody et al. (2009) only used selected subscales of the FFMQ, a multidimensional measure of mindfulness, and found that an emotion regulation strategy, such as decentering, did not mediate the relationship between mindfulness and psychological health, whereas Pearson et al. (2015) utilized the MAAS, a unidimensional measure of mindfulness, and found that the same emotion regulation strategy assessed in Carmody et al.'s (2009) study, decentering, did mediate the relationship between mindfulness and distress.

Specific to the emotion regulation strategy, decentering, prior studies have shown that decentering may be one potential mechanism of change that is directly linked with better psychological health in both mindfulness cross-sectional correlation and intervention

studies (Shapiro et al. 2006; Ma & Siu, 2018; Pearson et al. 2015). For example, Pearson, Brown, Bravo, and Witkiewitz (2015) and Hayes-Skelton and Graham (2013) found that decentering had significantly mediated the relationship between trait mindfulness and anxiety in a sample of college students. Concordant with these findings, results from intervention research have also shown support that decentering can explain the relationship between mindfulness and mental health. Hoge et al. (2015) found that increases in decentering mediated the association between mindfulness-based stress reduction (MBSR) training and reduced anxiety. Moreover, the direct effect of MBSR on anxiety symptoms after taking into account changes in decentering was not significant, further suggesting that mindfulness helps to ameliorate symptoms of anxiety through increases in decentering. Findings from this study also suggested that mindfulness reduces worry through increases in more awareness and nonreactivity (Hoge et al. 2015; Desrosiers et al. 2013a). Overall, research to date suggests that decentering can help to explain the relationship between higher levels of mindfulness training and better mental health, because more mindfulness can increase the ability to decenter, which can lead to positive mental health outcomes (Shapiro et al. 2006; Gecht et al. 2014; Bednar et al. 2020; Burzler et al. 2019).

While some cross-sectional survey research has identified decentering as a mediator between mindfulness and distress, specifically symptoms of anxiety and depression (Pearson et al. 2015; Gecht et al. 2014), others have concluded differently and found decentering to only partially account for the relationship between mindfulness and psychological health (Brown, Bravo, Roos, & Pearson, 2015; Hayes-Skelton & Graham, 2013). One study (Bhambhani & Cabral, 2016) found that decentering did not mediate

the relationship between mindfulness and anxiety or stress in a sample of college students and adults employed at a university, rather, when an alternative model was tested, mindfulness mediated the relationship between decentering and distress. Being more mindful of the present moment did not foster more awareness of one's internal experiences and the ability to distance oneself from the mental event, rather the ability to have a "bird's eye view" (Bhambhani & Cabral, 2016) of one's life allowed one to be more centered to the present moment. To date, no other study has found support for this. Thus, such inconsistencies in the literature suggest that the proposed mechanisms of mindfulness models should be replicated with similar measures across different studies to determine the role of specific emotion regulation strategies in better understanding and explaining the relationship mindfulness and mental health, specifically, lower levels of distress (stress and anxiety).

### **Confounding Variables: Gender, Race, and Previous Meditation Experience**

Potential confounders in the current study, such as gender, race, and history of prior meditation experience (yes or no) were controlled for in the mediation model to adjust for the effect they might have on the relationship between the predictor (trait mindfulness) and outcome variable (distress) and the relationship between the mediator (decentering) and the outcome variable (stress and anxiety scores). Adjustment for likely confounding influences is needed to reduce bias in estimating the mediation pathways.

Findings from previous studies suggests that men and women report different levels of distress and mindfulness. More specifically, it was found that women tend to experience greater levels of psychological distress than men (Upchurch & Johnson, 2019), as evidenced by women reporting greater levels of stress and anxiety. Further,

females report higher levels of mindfulness than males (Sturgess, 2012), whereas other studies have found that men may potentially benefit more from active mindfulness training, such as yoga (Rojiani, Santoyo, Rahrig, Roth, & Britton, 2017). One explanation is that while women tend to experience positive and negative emotions more intensely than men, when faced with a negative stimuli, women are more likely to engage in adaptive emotion focused coping skills, such as mindfulness to deal with the stressor (Rojiani et al. 2017; Sturgess, 2012), whereas men are likely to engage in avoidance or withdrawal coping skills (Tamres, Helgeson, & Janicki, 2002) which can exacerbate more distress. Overall, most of the research seems to suggest that mindfulness-based interventions yield more benefits for women than men (Rojiani et al. 2017), perhaps because there is a paucity of published mindfulness studies with sufficient male representation (Chin, Anyanso, & Greeson, 2019).

We controlled for race because members of minoritized racial groups tend to report higher levels of distress and presumably different levels of mindfulness compared to their white counterparts because studies have found that much of mindfulness has predominantly been tailored to the white experience (Magee, 2017; Watson-Singleton, Black, & Spivey, 2019). For example, Black people, commonly report increased levels of psychological distress (Biggers, Spears, Sanders, Ong, Sharp, & Gerber, 2020; Williams, Kanter, & Ching, 2017) and studies support that they are at increased risk for mental health concerns (Sue, Capodilupo, & Holder, 2008). Moreover, one of the earliest studies (Landrine & Klonoff, 1996), found that Black people are often subjected to higher rates of racial discrimination and unfair treatments than white people, which can negatively impact their mental health. In particular, it was found that 98% of Black people reported

experiencing some type of racism at some point in their lives, and 95% of those events were perceived as stressful (Landrine & Klonoff, 1996). Studies support a robust relationship between increased levels of perceived discrimination and psychological distress (Pascoe & Richman, 2009). Additionally, the benefits of mindfulness as a state, trait, and training are unclear if it extends to people of color because there is a dearth of research in this area (Chin, Anyanso, & Greeson, 2019). Of the limited studies, one pilot study (Zhang & Emory, 2014) with African American pregnant women found that contrary to what was predicted, a 4-week mindfulness training program did not increase mindfulness levels or reduce perceived stress levels at post-intervention. Therefore, the current literature on mindfulness research seem to suggest that the purported benefits of mindfulness might be stronger or only observed in white people.

Previous history of meditation experience was controlled for in this study. Regular mindfulness practice can increase use of specific mindfulness coping skills and trait mindfulness, which is linked with better psychological health, specifically lower levels of stress and anxiety (Hanley, Garland, & Black, 2013). Therefore, the present study controlled for the variables above so we can better understand the nature of the effect that decentering has on mediating the relationship between mindfulness and stress and anxiety, independent of confounding variables.

### **Gaps in the Literature**

The present study addresses a gap in the literature by examining whether an emotion regulation strategy, specifically, decentering, is a mechanism that mediates the relationship between certain trait mindfulness skills, namely Nonjudging and Nonreactivity, and stress, and anxiety. There are limited mediation studies examining the

link between these variables with decentering as a mediator- with many of studies revealing mixed findings (Bhambhani & Cabral, 2016; Brown, Bravo, Roos, & Pearson, 2015; Hayes-Skelton & Graham, 2013) in student samples. For example, Bhambhani and Cabral (2016) did not find support for decentering as a mediator in explaining the link between mindfulness and psychological distress, whereas Brown et al. (2015) and Hayes-Skelton and Graham (2013) both found that decentering partially mediated the relationship between mindfulness and distress. There are even fewer studies broadly examining whether emotion regulation mediates the relationship between trait mindfulness and distress, particularly stress and anxiety, using the Five Facet Mindfulness Questionnaire [FFMQ] (McDonald and Baxter, 2017; Brown et al. 2015). Although the existing cross-sectional studies on decentering as a mediator of mindfulness and distress have been conducted with large sample sizes (Gecht et al. 2014; Hayes-Skelton & Graham, 2013), one fundamental limitation (Pearson et al. 2015) from these previous mediation studies is that they operationalized mindfulness using a unidimensional questionnaire, such as the Mindful Attention Awareness Scale (Pearson et al. 2015) or the Cognitive and Affective Mindfulness Scale (Bhambhani & Cabral, 2016), instead of conceptualizing mindfulness as a multidimensional construct. Also, while some researchers have utilized a multidimensional measure of mindfulness, such as the FFMQ to explore whether emotion regulation mediates the relationship between mindfulness and distress, they combined the scores of all five facets of mindfulness into one composite score (Desrosiers et al. 2013b), and either chose not to look at the facet Nonreactivity because the items were too closely representative of the items intended to assess decentering (Hayes-Skelton & Graham, 2013), or looked at the Observing facet



separately (Freudenthaler et al. 2017) because Observing did not load into well into a single-factor model of mindfulness, especially in non-mediating samples (Baer et al. 2006). To our knowledge no studies have looked at the independent effects of Nonjudging and Nonreactivity on decentering (MacDonald & Baxter, 2017), thereby reducing psychological distress (Gross & John, 2003).

While there is research supporting that emotion regulation can mediate the relationship between mindfulness and distress, particularly stress and anxiety, in cross-sectional and intervention studies (Freudenthaler et al. 2017; Desrosiers et al. 2013b; MacDonald & Baxter, 2017; Burzler et al. 2019; Hoge et al. 2015), less is known about more specific emotion regulation strategies, such as decentering, which can better elucidate how mindfulness relates to psychological health. Further, despite support for decentering as a mediator between mindfulness and distress, only one mediation study to our knowledge has tested this model by investigating distinct facets of mindfulness among college students (Brown et al. 2015). The present study only examined two specific facets of mindfulness, Nonjudging (Cash and Whittingham, 2010) and Nonreactivity (MacDonald & Olsen, 2020; Desrosiers et al. 2013a) because past research supports that these two facets are the most important predictors of psychological well-being, specifically lower levels of stress and anxiety. Therefore, to address these gaps, the present study utilized a multidimensional measure of mindfulness, the FFMQ, to examine whether decentering could account for the relationship between Nonjudging and Nonreactivity and less distress in a sample of college students.

## **Aim**

This study will contribute to the literature by investigating whether decentering mediates the relationship between facets of trait mindfulness, specifically Nonjudging and Nonreactivity, and less stress and anxiety, while controlling for gender, race, and previous meditation experience.

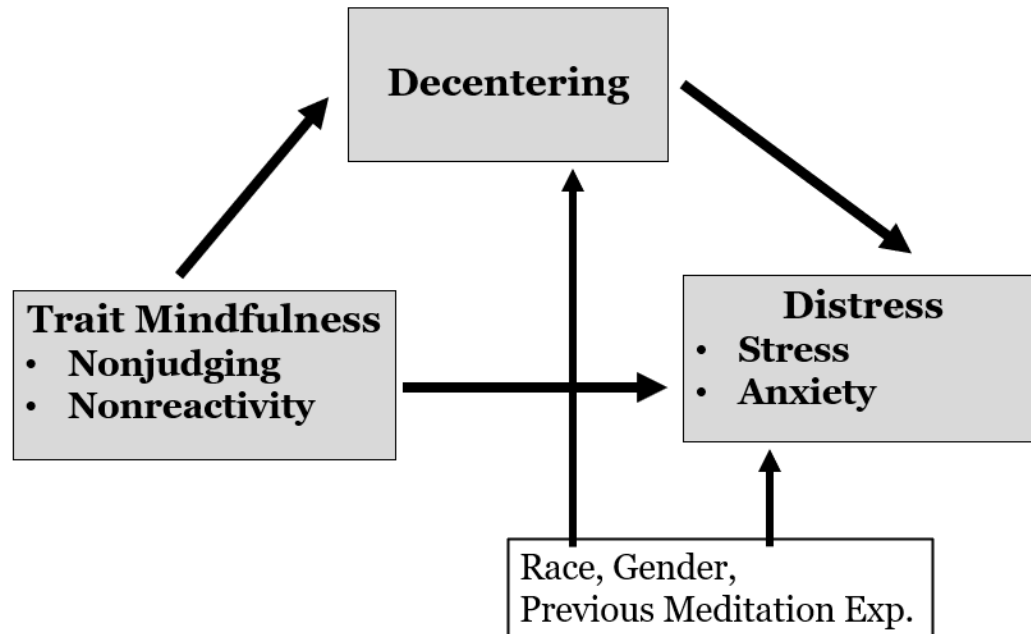
## **Hypothesis**

I hypothesize that facets of trait mindfulness, specifically Nonjudging and Nonreactivity, will have a negative indirect effect on stress and anxiety through more decentering. I expect trait mindfulness to have a positive effect on decentering which will in turn have a negative effect on distress (see Figure 1).

## Conceptual Model

**Figure 1**

*Path Diagram of Mediation*



## Literature Search Terms for Background Information

I searched Web of Science, PsychINFO, and PsycArticles using the following keywords: ("emotion regulation") AND ((mediator OR mediating OR mediate OR mediation)) AND (((mindful\*))) AND (((stress OR anxiety))). The search resulted in 227 hits. After omitting the duplicates and screening for the inclusion criteria, 17 articles were selected for review.

## Chapter 2

### Methods

#### Study Design

The present study was a large cross-sectional survey conducted from April 2018 to September 2019 where data were collected from a public research university in the northeastern United States. Participants were recruited from Introductory Psychology courses to fulfill a research requirement. Eligible participants completed the survey study online through Qualtrics and received course credit using the SONA system. Students were recruited using several methods, including in-person announcements, flyers, and emails. The protocol was approved by the IRB at Rowan University.

#### Participants

Undergraduate students (n=534) participated in this study (65% female; *mean* age = 20.41 [SD = 4.21], *median* age = 19.0 [IQR = 18-21]; *range* = 18-56; 67% White, 13% Black, 7% Asian, 5% Multiracial, 1% Native American, 6% Other, and 1% chose not to answer; median household income = \$50,000-\$100,000). A total of 36 participants were later excluded from the analysis because they were missing data. Participants were ineligible to partake in this survey study if they were younger than 18 years old or older than 64 years old. Most of the participants reported that they were in their first and second year in college (37% and 28% respectively) at the time of the survey study completion. Also, many students in the current sample reported having prior meditation experience (43% yes; *mean* number of meditation experience = 3.16; *range* = 0-25).

## **Procedure**

The survey study was completed through Qualtrics. Participants completed an informed consent online, followed by answering basic demographic questions, and filled out several different batteries of self-report questionnaires examining different facets of dispositional mindfulness, stress, well-being, cognitive functioning, and health behaviors. Data was collected for a larger study that investigated patterns in which certain facets of trait mindfulness may relate to better health and well-being. For the variables of interest in the present study, trait mindfulness was assessed with the *Five Facet Mindfulness Questionnaire* (FFMQ - Short-Form; Gu et al., 2016) and emotion regulation was assessed with the *Decentering* subscale of the Experiences Questionnaire (Fresco et al., 2007). Stress was measured using the Perceived Stress Scale (PSS-10; Cohen & Janicki-Deverts, 2012) and anxiety was assessed using the National Institutes of Health (NIH) Patient-Reported Outcomes Measurement Information System (PROMIS)- *Emotional Distress - Anxiety – Short Form 7a* (Cella et al. 2010). Once the survey was completed, researchers asked participants to fill out a separate survey which was used to collect identifying information to provide course credit.

## **Measures**

### ***Mindfulness***

*Five Facet Mindfulness Questionnaire* (FFMQ-SF; Baer, Carmody, & Hunsinger, 2012- 15-item short-form version of the FFMQ is a measure of dispositional mindfulness that assesses mindfulness scores across five domains: Observing, Describing, Acting with Awareness, Nonjudging, and Nonreactivity. The responses ranged from 1 (“Never or very rarely true”) to 5 (“Very often or always true”). Scores on only the Nonjudging and

Nonreactivity facets were utilized for this study. The following are sample items from the two facets: 1) Nonjudging was reverse coded “I believe some of my thoughts are abnormal or bad and I shouldn’t think that way,” and 2) Nonreactivity “When I have distressing thoughts or images I just notice them and let them go.” Higher scores indicated higher levels of mindfulness.

### ***Emotion Regulation***

*Decentering subscale of the Experiences Questionnaire* (Fresco et al., 2007)- 11-item subscale that evaluated the ability to “step back” from negative thoughts, feelings, and sensations. The following items on the EQ assesses decentering: 3, 6, 9, 10, 12, 14, 15, 16, 17, 18, and 20. Items were rated on a 5-point Likert scale that ranged from 1 “Never” to 5 “All the time.” Although the decentering subscale on the EQ was calculated by creating one composite score, nevertheless, it still assessed areas specific to the three psychological processes described by Berstein et al. (2015): 1) Meta-awareness “I have the sense that I am fully aware of what is going on around me and inside me” (EQ 16); 2) Disidentification “I can separate myself from my thoughts and feelings” (EQ10); and 3) Reduced reactivity to thought “I can observe unpleasant feelings without being drawn into them” (EQ 15).

### ***Stress***

*Perceived Stress Scale* (PSS-10; Cohen et al. 1983)- 10-item scale that assesses perceived stress level over the past 30 days. Participants responded on a 5-point Likert scale ranging from 0 “Never” to 4 “Very often.” Sample items included: “In the last month, how often have you felt nervous and stressed?” and “In the last month, how often have you found that you could not cope with all the things that you had to do?”

## ***Anxiety***

*PROMIS Anxiety Short form 7a*- 7-item NIH PROMIS measure that assesses in the past week, how true one agrees with the statements on a 1 “Never” to 5- point Likert scale “Always” scale: 1) I felt fearful, 2) I felt anxious, 3) I felt worried, 4) I found it hard to focus on anything other than my anxiety, 5) I felt nervous, 6) I felt uneasy, and 7) I felt tense.

## **Statistical Analysis Plan**

Statistical analyses were performed with SPSS 27.0 and R. Descriptive statistics (means, standard deviation, skewness, and kurtosis) will be calculated to obtain information about the data and examine whether the distributions were normal, and the assumptions were plausible. In addition, the flexplot package in R was used to visualize, describe the data, and test assumptions, such as linearity. Next, using PROCESS macro for SPSS (Hayes, 2019) indirect effects were computed. A total of four mediation models were tested to examine whether decentering mediates the relationship between two specific facets of trait mindfulness (Nonjudging and Nonreactivity) and two distinct measures of distress (stress and anxiety), while controlling for covariates, including gender, race, and prior meditation experience. The mediation analyses were conducted using the bootstrapping methods in the Preacher and Hayes’ software (Preacher & Hayes, 2004; Hayes, 2013), wherein indirect effects for each of 5000 random samples will be calculated. The bootstrapping method provides a more accurate confidence interval, by repeatedly resampling the original dataset, thereby providing a less biased test of mediation (Fritz & MacKinnon, 2007). Statistical significance of the indirect effects was determined if the 95% bias-corrected confidence intervals did not contain zero.

Unstandardized beta values were reported to interpret a change of one standard deviation in: 1) the predictor variable on the outcome variable, 2) the predictor variable on the mediator variable, and 3) the mediator variable on outcome variable. Finally, to determine effect sizes, standardized betas were obtained wherein 0.10, 0.30, and 0.50 indicates a small, medium, and large effect, respectively (Cohen, 1988). Effect sizes were also computed for variances explained, where 0.02-0.12 indicates a small effect, 0.13-0.25 indicates a medium effect, and a value greater than 0.26 indicates a large effect.

### **Preliminary Analyses**

Of 774 students who initially responded to the survey study, 534 students participated and were included in the analysis. A rigorous quality assurance was handled in which participants were excluded if they 1) completed the survey in less than 15 minutes, 2) did not complete the survey in its entirety, and 3) scored more than 6 incorrect item reversals. The purpose of the quality check was to exclude unreliable and invalid data from the analysis process. Despite omitting 240 survey respondents due to the above-mentioned reasons, 534 participants is still a large sample size, representative of the Rowan University students and college students nation-wide for most self-report studies. The sample characteristics were representative of the Rowan undergraduate population and the scores from the self-report measures were comparatively similar to the normed sample of college students on the different measures. Additionally, statistical analyses did not comparably differ between the included and excluded groups in the current sample.



## Descriptive Statistics

Visuals were studied to look at the distribution of data points. Figures 2-5 illustrates residual distribution of the data points for the relationship between the predictor variable on the outcome variable. Assumptions for these models were met. All figures showed normal distribution of the residuals and homoscedasticity. Moreover, with the exception of Figures 4 and 5, the analysis plot (see Figures 2-3) showed a linear relationship between the predictor variable (mindfulness) and the outcome variable (distress) that was consistent across all levels of the mediator variable (decentering). The flexplots from R did not show predictions for the relationships between the predictor variable on the mediator variable and the mediator variable on the outcome variable. Therefore, additional correlations were conducted using SPSS (see Table 2) and revealed the relationships between trait mindfulness and decentering (all  $p$ 's  $<.001$ ) and decentering and distress (all  $p$ 's  $<.001$ ) were linear.

Descriptive statistics are reported in Table 1. The means and standard deviations for the study measures were within normal ranges of what we expected to find with our sample of undergraduate students in comparison to psychometric papers with normed means among college students (Table 1). On the FFMQ-15, students in our study reported a mean of 10.00 on the Nonjudging facet (SD = 3.10) and 9.10 on Nonreactivity (SD = 2.50). On the EQ, students reported a mean of 37.50 on the Decentering subscale (SD = 7.50). While most of the scores were within the expected range, slightly higher distress scores were observed with the current sample of students compared to the normed sample. The mean PSS score was 19.50 (SD = 7.00) and the mean Anxiety score on the NIH PROMIS was 56.90 (SD=10.30).

## **Multicollinearity**

A Pearson's correlation was conducted to test if the predictor variables (facets of trait mindfulness- Nonjudging and Nonreactivity) was highly related to the mediator variable (decentering). The output is displayed in Table 2. Although the standard way to assess for multicollinearity is to calculate the variance inflation factor (VIF), studies have found that for large bivariate correlations, the commonly used cutoffs are .80 to .90, which indicates a strong linear relationship and suggests collinearity is a concern (Mason & Perreault, 1991). Results from the present study indicated that multicollinearity is not a concern for these variables. Nonjudging ( $r = 0.41$ ) and Nonreactivity ( $r = 0.27$ ) were related to decentering, but the constructs did not highly overlap, suggesting that the constructs are distinct measures, therefore should be investigated separately.

## Chapter 3

### Results

A mediation analysis was conducted to examine if facets of trait mindfulness, specifically Nonjudging and Nonreactivity, have a negative indirect effect on stress and anxiety through decentering will adjusting for covariates, such as gender, race, and previous meditation experience, as these covariates can impact how one is able to regulate their emotions and their distress levels. For example, past studies have found that women tend to experience higher levels of stress and anxiety than men (Upchurch & Johnson, 2019) and are more likely to use adaptive emotion regulation skills (Rojiani et al. 2017). Also, minoritized racial groups (Williams et al. 2017) and those without any prior meditation experience report (Hanley et al. 2013) higher levels of distress.

#### Nonjudging and Distress

Controlling for gender, race, and previous meditation experience, the indirect effect of Nonjudging on stress ( $b = -.42$ , 95% CI =  $-.55, -.31$ ) and anxiety ( $b = -.44$ , 95% CI =  $-.60, -.30$ ) through decentering was significant (see Figures 6 and 7). This meant that for every one unit change in Nonjudging, it was predictive of  $-.42$  standard deviation change in stress indirectly through decentering. Similarly, for every one unit increase in Nonjudging, it was predictive of  $-.44$  standard deviation change in anxiety through decentering. Further, decentering explained about 37% of the association between Nonjudging and stress ( $\beta = -.18$ , small effect) and 25% of the relationship between Nonjudging and anxiety ( $\beta = -.13$ , small effect). Additionally, the direct effect between Nonjudging and stress ( $b = -.70$ ,  $se = .09$ ,  $p < .001$ ) and anxiety ( $b = -1.29$ ,  $se = .13$ ,  $p < .001$ ) remained significant, indicating that people who are higher on Nonjudging

reported being less distressed, even after accounting for the mediating effect of decentering. The total effect of Nonjudging on stress ( $b = -1.13$ ,  $se = .09$ ,  $p < .001$ ) and anxiety ( $b = -1.73$ ,  $se = .13$ ,  $p < .001$ ) was also statistically significant.

Further, as shown in Figure 6, 47% of the variability in stress (large effect) was explained by Nonjudging, decentering, gender, race, and meditation experience. In this same path diagram, 18% of the variability in decentering (medium effect) was explained by Nonjudging, gender, race, and meditation experience. In this model (Figure 6), the strongest predictor of distress was decentering ( $\beta = -.46$ , medium to large effect). In a different model, shown in Figure 7, that predicted more Nonjudging to be linked with less anxiety through higher levels of decentering, it was found that 41% of the variability in anxiety (large effect) was explained by Nonjudging, decentering, and the three covariates (gender, race, and meditation experience). Similarly, 18% of the variability in decentering (medium effect) was explained by Nonjudging and the three covariates. In this model (Figure 7), the strongest predictor of anxiety was both Nonjudging ( $\beta = -.38$ , medium effect) and decentering ( $\beta = -.33$ , medium effect).

### **Nonreactivity and Distress**

Similar to Nonjudging, the indirect effect of Nonreactivity on stress ( $b = -.40$ , 95% CI =  $-.59, -.23$ ) and anxiety ( $b = -.50$ , 95% CI =  $-.73, -.29$ ), while controlling for the above-mentioned covariates, through decentering was significant (see Figures 8 and 9). For every one unit change in Nonreactivity, it was predictive of  $-.40$  standard deviation change in stress and  $-.50$  standard deviation change in anxiety indirectly through decentering. Decentering explained about 95% of the association between Nonreactivity and stress ( $\beta = -.14$ , small effect), and most of the relationship between Nonreactivity and

anxiety ( $\beta = -.12$ , small effect). The direct effect of Nonreactivity on stress dropped to near zero ( $b = -.02$ ,  $se = .11$ ,  $p = .82$ ) indicating decentering mediated the relationship, whereas the direct effect of Nonreactivity on anxiety remained substantive and nearly statistically significant ( $b = .29$ ,  $se = .16$ ,  $p = .08$ ) indicating that decentering partially mediated the relationship. This counterintuitive effect of the residual relationship between Nonreactivity and anxiety was unexpected, but perhaps suggests that Nonreactivity might not be helpful unless it is simultaneously taught and practiced with an emotion regulation skill, such as decentering. Moreover, the total effect of Nonreactivity on stress ( $b = -.42$ ,  $se = .13$ ,  $p = .0008$ ) explained by decentering was statistically significant, however, the total effect of Nonreactivity on anxiety ( $b = -.22$ ,  $se = .18$ ,  $p = .24$ ) was not significant.

Additionally, as shown in Figure 8, 37% of the variability in stress (large effect) was explained by Nonreactivity, decentering, gender, race, and mediation experience, and the same model explained 8% of the variability in decentering (small effect). In this model (Figure 8), the strongest predictor of stress was decentering ( $\beta = -.58$ , large effect). In a different path diagram (Figure 9), it was found that 29% of the variability in anxiety (large effect) was explained by Nonreactivity, decentering, and the three covariates, and 8% of the variability in decentering (small effect) was explained by Nonreactivity and the three covariates. In this model (Figure 9), the strongest predictor of anxiety was decentering ( $\beta = -.49$ , large effect).

## Chapter 4

### Discussion

The aim of the present study was to investigate if decentering, a mindful emotion regulation strategy, is a mechanism that mediates the relationship between trait mindfulness and psychological distress. There is limited research documenting the role of decentering on mindfulness and distress, and the existing body of literature suggests inconsistent results (Bhambhani & Cabral, 2016; Ma & Siu, 2019; Brown, Bravo, Roos, & Pearson, 2015; Hayes-Skelton & Graham, 2013). The findings from the current study supported the hypothesis that decentering mediated the relationship between Nonjudging and Nonreactivity on the one hand, and stress and anxiety on the other. Consistent with previous research on college students from cross-sectional survey studies (Ma & Siu, 2019; Pearson et al. 2015; Gecht et al. 2014; Hayes-Skelton & Graham, 2013), a clinical sample from an intervention study (Hoge et al. 2015), and Shapiro et al.'s (2006) theoretical model of mindfulness, higher levels of trait mindfulness were related to more decentering, which in turn was related to better psychological health, in this instance, lower levels of stress and anxiety. Furthermore, although both Nonjudging and Nonreactivity were related to lower levels of psychological distress through more levels of decentering, it found that decentering strongly predicted less stress and anxiety in three of four mediation models, however, in one of the mediation models with Nonjudging as the predictor, decentering as the mediator, and anxiety as the outcome measure, Nonjudging was the strongest predictor of less anxiety.

The pattern of these results is consistent with the previous literature. For example, Ma and Siu (2019) and Pearson et al. (2015) also found support that trait mindfulness was

negatively related with psychological distress, and this relationship was significantly mediated by decentering. Similar to the present study, Ma and Siu (2019) used the Experiences Questionnaire (Fresco et al. 2007) to measure decentering, however, they used a unidimensional measure to assess mindfulness (MAAS; Brown & Ryan, 2003) in a sample of college students. In line with this, Pearson et al. (2015) found that decentering significantly mediated the relationship between trait mindfulness and anxiety symptoms in a diverse sample of college and graduate students, primarily comprised of Hispanics/Latinos and Blacks/African Americans (only 50.5% White). Pearson et al. (2015) used the same measures of decentering and mindfulness cited in Ma and Siu's (2019) work. In another study, Hoge et al. (2015) found that changes in decentering mediated the effect of mindfulness training on anxiety symptoms among a clinical sample of adults diagnosed with Generalized Anxiety Disorder who were trained in mindfulness-based stress reduction (MBSR). More specifically, MBSR decreased symptoms of anxiety (assessed with the Beck Anxiety Inventory), through increases in decentering. Although these studies have found trait mindfulness to be linked to better mental health through more levels of decentering, their models did not look at the independent effects of specific facets of trait mindfulness and how they can relate to better mental health.

Contrary to past studies that assessed trait mindfulness as a unidimensional measure and found that higher levels of trait mindfulness was linked with lower levels of distress, the present study advanced knowledge in this area of research by examining trait mindfulness as a multidimensional construct, using the Five Facet Mindfulness Questionnaire (Baer et al. 2012). Only one study (Brown et al. 2015) to our knowledge has looked at decentering as a mechanism that explains the relationship between distinct

facets of trait mindfulness and distress in a sample of college students with the FFMQ. Replicating this previous study, the results from the current study suggested that specific facets of trait mindfulness were associated with better mental health. In particular, the present study found that both Nonjudging and Nonreactivity were inversely associated with stress and anxiety through more levels of decentering. In other words, mindfulness allows one to be aware of their present moment experiences and reminds people that uncomfortable emotions, such as anxiety is merely just an emotion. They accept to tolerate the discomfort better because they realize that this is just a temporary mental state. Thereby, this process allows individuals to more easily distance themselves from their inner experiences (decenter/step-back) so that unpleasant events are perceived as less intense and they are less engaged in responding to it impulsively. In this sense, it promotes flexibility and reminds individuals that any distressing, thoughts, emotions, and sensations are merely “not facts,” or true representations of the self and their world (Garland et al. 2015). This shift in thinking allows one to see the “big[ger] picture,” and fosters “openness to alternative viewpoints” (Garland et al. 2015), which can help to reduce distress especially if one no longer learns to perceive negative events as threatening. These findings are in line with what Brown et al. (2015) found, such that, a double-mediated path model showed mindfulness facets, Nonjudging and Nonreactivity were associated with decentering, which was associated with distress intolerance, which was in turn associated with less psychological symptoms, such as stress and anxiety.

The current study revealed some patterns of interesting findings. One finding in particular was that Nonjudging was associated with less stress, but substantially related to less anxiety. An explanation for this could be that a non-evaluative, Nonjudgmental



stance can help cultivate more awareness and allow one to more easily detach from the intensity of the negative experience, thereby lead one to feel less anxious. For example, if one is more mindful of their worries through more Nonjudging, they can recognize that this feeling is another emotion just like any other emotion. By removing the “negative” label, one might be less likely to avoid (MacDonald & Baxter, 2017) and experience the emotional distress that is associated with the feeling accompanying worrying (Fisak & Von Lehe, 2012), thereby feel less anxious. Similarly, Cash and Whittingham (2010) also found that higher levels of Nonjudging was associated with lower levels of anxiety. Moreover, the present study found that higher levels of Nonreactivity, led to higher levels of decentering, thereby lower levels of anxiety. However, interestingly, the residual relationship between Nonreactivity and anxiety, above and beyond the effect of decentering was positive. This means that Nonreactivity could lead to more anxiety without decentering. One explanation for this unexpected finding is that being mindful does not necessarily lead to less anxiety, rather it is about increasing awareness and being “in touch with where we already are, no matter where that is... to feel the present moment [and] see it in its fullness” (Kabat-Zinn, 2009). The focus of mindfulness is on fully attending to the present moment, being aware, learning to accept, and taking wise action to not act on automatic thoughts or habitual impulses. Nonreactivity in the context of mindfulness refers to the capacity to not react to changes in one’s internal states. In this example, it means that Nonreactivity is about learning to manage and better control the anxiety through acceptance instead of decreasing it or completely eradicating the anxiety. Therefore, one learns to become more comfortable in tolerating distressing emotions, such as anxiety. Hence, individuals who are more Nonreactive do not

necessarily have to be less anxious, they can still endorse high levels of anxiety. As observed with the current sample, this description matches the sample of our college students. Many college students reported having prior meditation experience ( $n=241$ ; 43%), with a mean number of 3 years. Nevertheless, our sample of college students reported higher levels of anxiety (mean = 56.9, SD = 10.3) on the questionnaire compared to the normed sample of college students (mean = 50; SD = 10). This could be because they are navigating a major life transition of adjusting to stressors prevalent to many college students (e.g. learning to form new relationships, becoming independent, maintaining good grades, finding work to pay for their tuition, and beginning to worry about their future), which can be a source of anxiety. Therefore, having prior meditation experience, students can still report high levels of Nonreactivity and anxiety.

Additionally, the influence of a third variable can help to explain the relationship between high levels of Nonreactivity and high levels of anxiety. This third variable could be an emotion regulation strategy, such as an avoidant coping style. People who are avoidant copers commonly tend to withdraw (“step-back”) and freeze (“not react”) because they are making active efforts to avoid/escape a problem instead of dealing with it. However, in doing so, it can lead to more anxiety because by trying to avoid the problem, they inadvertently end up experiencing more anxiety by finding every means to run from the problem. Past research has found that avoidance is associated with high levels of anxiety (Tull, Gratz, Salters, & Roemer, 2004). Similarly, another strategy, such as emotional numbing might be associated with high levels of Nonreactivity, and in turn high levels of anxiety. Emotional numbing can serve as a temporary protective defense mechanism in which an individual shuts down (does not react or become

consumed/“taken over” by distressing thoughts and images) and detaches from an emotional experience, however repeated emotional numbing can lead to more anxiety because it will prevent one from living a fuller, more meaningful life.

Past studies have also reported counterintuitive findings with the Nonreactivity scale on the FFMQ and some announced a need to revise the items intended to measure this construct. Tran, Gluck, and Nader (2013) found the psychometric properties of Nonreactivity to weak in a large community sample and a sample of college students. Furthermore, Nonreactivity was positively related with a measure of suppression in both samples (Tran et al. 2013). Moreover, Baer et al. (2006) found that in a sample of nonmeditators, there was a weak association between Nonreactivity and the overall mindfulness score. This association was reported to be much stronger in a sample of meditators (Baer et al. 2006). One explanation for this is that the phrasing of the items assessing Nonreactivity might be difficult to comprehend and interpreted differently in a sample of individuals without a prior meditation history. For example, item 33 on the long version and item 15 on the short version of the FFMQ which is intended to measure Nonreactivity states, “When I have distressing thoughts or images, I just notice them and let them go.” A sample of meditators will respond differently to unpleasant experiences than a sample of nonmeditators. Meditators will notice both pleasant and unpleasant stimuli equally and when confronted with an unpleasant stimuli, they will be able to flexibly shift their attention to simply notice the discomfort and let it come and go freely because they realize that these are just fleeting mental events, not permanent. However, nonmeditators might notice negative stimuli more and might face more difficulties bringing their attention to the present moment because they are focused on getting rid of

this unpleasant experience by suppressing it. The negative stimuli are perceived as a threat, and they have not acknowledged that this is a temporary event. Nonreactivity items 4, 29, and 33 on the FFMQ were found to be positively related on the Emotion Regulation Questionnaire, a measure of suppression.

Findings from this study have implications in that they highlight the important role certain facets of mindfulness may serve in reducing distress. Cultivating skills like Nonjudgment and Nonreactivity through mindfulness practice is important because it may help to facilitate decentering which allows one to view their negative inner experiences that may be particularly stressful and anxiety-provoking from a distance, specifically watch it unfold from an observer point of view. In doing so, the individual may become less over-engaged with reacting to the intensity of their negative inner experiences and less likely to respond by worrying or avoiding in an effort to control their distress (MacDonald & Baxter, 2017; Hoge et al. 2015). Specifically, the mindful individual becomes less self-critical of labeling their emotions as bad (Nonjudging) and instead learns to accept unpleasant experiences (Nonreacting), so they are viewed as less distressing and more tolerable. Additionally, the process of disengaging from the intensity of inner experiences and taking a step back (decentering) buffers distress by reducing both physiological and emotion reactivity which is associated with less stress and anxiety (Hoge et al. 2015). Thus, mindfulness training teaches individuals to relate to their experiences differently, more specifically, through core values, such as allowance and acceptance, it promotes healthier ways to respond to unpleasant experiences. The results from the present study are especially helpful in that it can help to identify specific interventions that focus on fostering these skills which is beneficial in promoting better

mental health, specifically less stress and anxiety. Mindfulness-based interventions (MBIs), such as mindfulness-based cognitive therapy (MBCT) and mindfulness-based stress reduction (MBSR) programs can place stronger emphasis on deliberately teaching distinct mindfulness skills, which can help mitigate symptoms of stress and anxiety. Although most mindfulness-based interventions focus on these skills, specific interventions may pay more attention to teaching specific mindfulness practices and techniques. For instance, it is said that the loving-kindness meditation can help cultivate more levels of Nonjudging (Brown et al. 2015).

Future studies can explore whether distinct mindfulness skills, namely Nonjudging and Nonreactivity, operate via similar mechanisms by promoting more decentering, which is linked to better mental health. Research supports that mindfulness training appears to be successful in improving decentering and reducing psychological symptoms of distress (Bednar et al. 2020; Hoge et al. 2015; Carmody et al. 2009). One example in particular, Emotion Regulation Therapy (ERT) is a mechanism driven, evidence-based treatment that draws from frameworks of traditional and contemporary CBT principles, mindfulness-based practices, acceptance, and emotion-focused interventions (Mennin et al. 2018; Mennin et al. 2015). Similar to the results from the current study where it was found that mindfulness leads to more decentering and less distress, interventions such as ERT teaches mindfulness and emotion regulation skills in this sequential manner. ERT first teaches skills focused on mindfulness practice, such as increasing awareness and attending to the present moment experiences. The latter half of this intervention is focused on introducing emotion regulation skills (e.g. decenter, reframe), so one may take effective action with their emotionally evocative inner

experiences. Both open (Mennin et al., 2015) and randomized controlled trials (Mennin et al., 2018) examining the efficacy and mechanisms of ERT in university-based clinics, serving both students and the community have demonstrated promising support and strong effect sizes in improving one's quality of life through increases in skills, such as decentering, which helped to mitigate symptoms of both stress and anxiety. These intervention findings grounded on mindfulness practices provides insight on how these interventions work and are effective. Results suggest that mindfulness reduces stress and anxiety through increases in decentering. Cultivating both mindfulness and decentering skills are necessary to alleviate distress, however they develop in a sequential manner.

Targeting specific mindfulness and emotion regulation skills through interventions are imperative because it can help individuals who report higher levels of stress, such as college students, see their world in a different lens. They will have greater awareness of the here and now, and in turn be less judgmental or reactive during stressful situations. Instead, they learn to be more flexible in changing how they think or feel in order to adapt and cope better with the situation. For example, if an individual receives a bad grade on an exam and notices their anxiety rising, instead of seeing this as a negative experience and avoiding this feeling, they can choose to experience it and acknowledge that they are feeling this way. One could remind themselves that this is just one grade that they received now of many exams that they can study for to pull their grades up in the class. Doing so, prevents one from being caught in a vicious cycle of anxiety and allows one to interpret the situation more clearly, by stepping back and seeing this whole picture. This one bad grade is not indicative of whether one is a "failure" or marker or whether they would fail the class. Therefore, being able to be mindful and decenter in the moment

can help reduce the anxiety. This way of thinking has positive consequences on one's mental health because mindful people report better psychological health (MacDonald & Baxter, 2017). Mindfulness training particularly with college students can be helpful in alleviating some of the distress college students are challenged with in their everyday lives. Further, there are implications in that mindfulness training can improve psychological and emotional health which may be linked with better academic performance.

A limitation of this study that warrants attention is the cross-sectional design, which limits the ability to draw causal inferences. Longitudinal or experimental studies can help demonstrate temporal precedence- direction of the relationships between the variables (e.g. whether a change in mindfulness, actually leads to a change in decentering score, and therefore leads to less stress and anxiety). Additionally, in the present study, it was found that decentering did not fully mediate the association between most facets of trait mindfulness and stress and anxiety (with the exception of decentering mediating the relationship between Nonreactivity and stress, which was the only full mediation finding). This alludes to the possibility that there might be other constructs/mechanisms/pathways which can also contribute to how mindfulness leads to a stronger association with mental health, specifically lower levels of stress and anxiety. The current study only explored one mechanism in which mindfulness leads to less distress because data was collected on only two emotion regulation measures, only one of which was a specific emotion regulation strategy- decentering. Research (Desrosiers et al. 2013b; MacDonald & Baxter, 2017; Bhambhani & Cabral, 2016) suggests there might be other mechanisms that can explain mindfulness and its related mental health benefits,

such as other emotion regulation skills (e.g. rumination, reappraisal, self-awareness, thought suppression etc.), which merits further investigation.

A pathway of interest to explore would be the role of cognitive flexibility.

Cognitive inflexibility is one characteristic of people with Generalized Anxiety Disorder (Lee & Orsillo, 2014), a population of people who report high levels of stress and are anxious more days than not. These individuals have difficulty sustaining attention to the present moment because their minds are constantly wandering and worrying.

Mindfulness training is said to improve aspects of cognitive flexibility, better “switching,” as measured by the Stroop Task (Lee & Orsillo, 2014). If mindfulness training can promote and enhance cognitive flexibility through exposure and continuous reliance on paying attention to the present moment experience, then, when faced with negative stimuli, individuals can learn to shift their attention from their habitual, automatic responses, such as worrying, to adaptively deal with their stressor, for example, by attending to their situation but not engaging in any of the emotional triggers that may take place. People who report higher levels of cognitive flexibility might feel less engaged in controlling a stressful situation that might otherwise be uncontrollable, disengage in the worrying process, and in turn feel less stressed and anxious.

Since alternate mediation models were not tested with other mediator variables, we cannot conclude for certain that decentering is the only way in which mindfulness is linked with less distress. Therefore, this model should be tested with similar measures across different studies with diverse groups of people and expanded to test a number of ways (e.g. explore other mechanisms of mindfulness, reverse directionality models,



causal experiments) to determine how mindfulness exerts its benefits on psychological health.

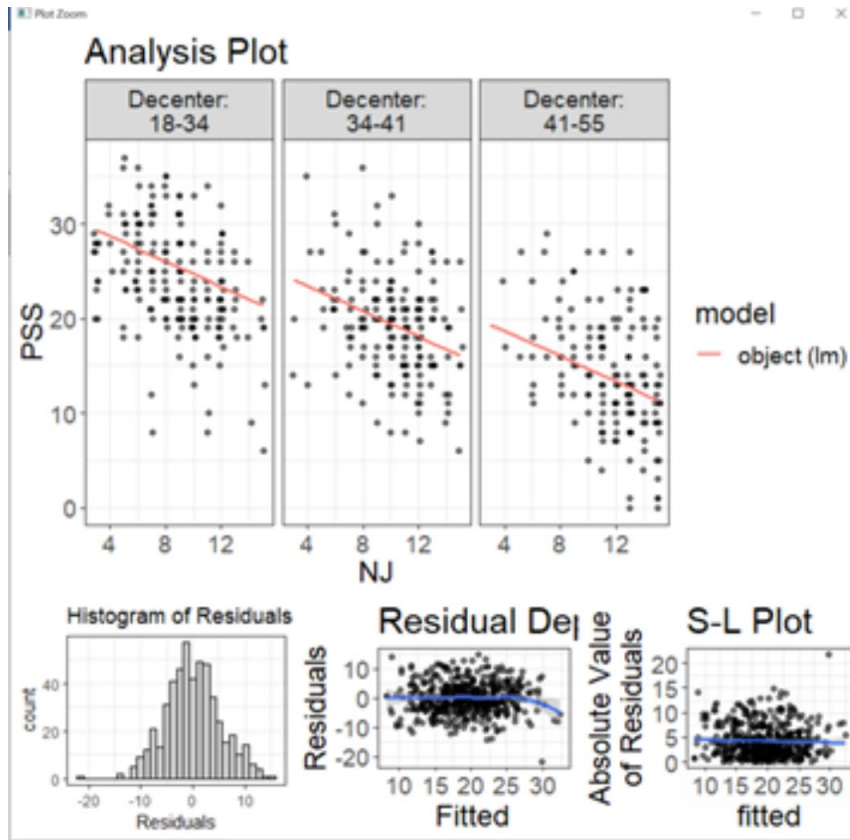
Another limitation is that the Observing facet was omitted from the present study. Mindfulness proponents, such as Kabat-Zinn (1990) and Bishop et al. (2004) have argued that mindfulness involves two fundamental parts: awareness and acceptance, where the acceptance aspect is comprised of facets such as Nonjudging and Nonreactivity, and awareness consists of Observing. Both processes make up mindfulness, however the Observing facet was not considered in the mediation models because past studies have found equivocal results, specifically Observing differed from the other facets of mindfulness and their associations with health-related variables were supported in the opposite direction for some studies (Baer et al. 2006; Cash & Whittingham, 2010; Tran et al. 2013; Freudenthaler et al. 2017; Curtiss & Klemanski, 2014) and in the expected direction for others (Garland et al. 2013). An earlier study by Baer et al. (2006) found that among nonmediators, higher levels of Observing was associated with higher levels of anxiety. That might be because present moment awareness of one's experiences (e.g. thoughts, emotions, and sensations) can be adaptive, however it can be maladaptive if it is not accompanied by a Nonjudgmental and Nonreactive stance (Baer et al. 2004). However, a later study conducted by Garland et al. (2013) found that more Observing was associated with less anxiety. Further, similar to the present study, Brown et al. (2015) investigated whether decentering mediated the relationship between specific facets of trait mindfulness and psychological health, and found that Observing was not significantly associated with decentering or anxiety symptoms. Corroborating this finding, Baker et al. (2019) found no relationship between the Observing facet and

anxiety symptoms. These inconsistent results suggest the exclusion of the Observing facet from the current study.

However, despite these limitations, there were also notable strengths. A large sample was recruited for the current study and a multidimensional measure of mindfulness was utilized to better understand associations between specific facets of trait mindfulness (Nonjudging and Nonreactivity), decentering, and stress and anxiety. The findings from this study contributes to the literature by supporting decentering as a mediator of mindfulness and mental health in college students. The findings highlight the important role decentering may contribute, in regards to higher levels of trait mindfulness and lower levels of distress. College students who reported higher levels of Nonjudging and Nonreactivity reported more decentering, thereby less stress and anxiety. Decentering may be one strategy for reducing distress, and interventions for college students should focus on enhancing this skill. Although existing empirically supported treatments, such as MBIs place emphasis on cultivating awareness and teaching emotion regulation skills, they do not always place direct emphasis on teaching different ways that people can gain perspective (e.g. decenter). Some common distancing skills (Mennin et al 2018; Mennin et al. 2015) includes writing down different thoughts and emotions on a piece of paper and throwing it against a wall to create some physical distance between the thought/emotion and the individual. Another way (Mennin et al 2018; Mennin et al. 2015) is to visually imagine placing an emotional reaction on branches of a tree. Tailoring existing interventions to target these specific skills can be helpful for individuals who report low levels of decentering and poor mental health outcomes.

**Figure 2**

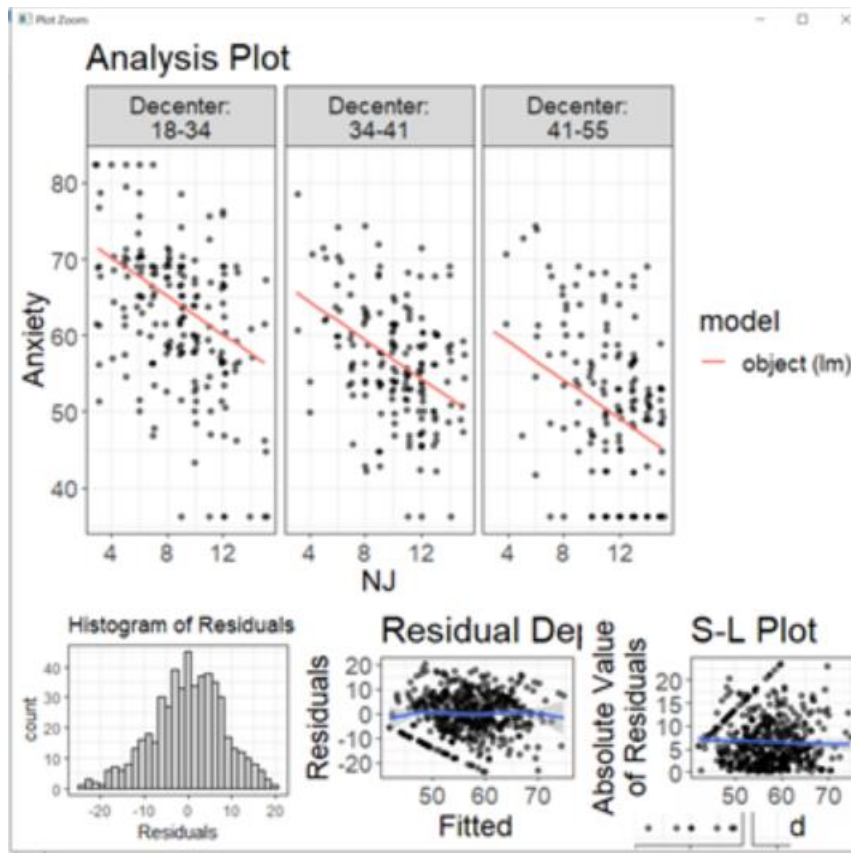
*R Flexplot: Nonjudging and Stress*



*Note.* Assumptions of normality, linearity, and homoscedasticity for residuals

**Figure 3**

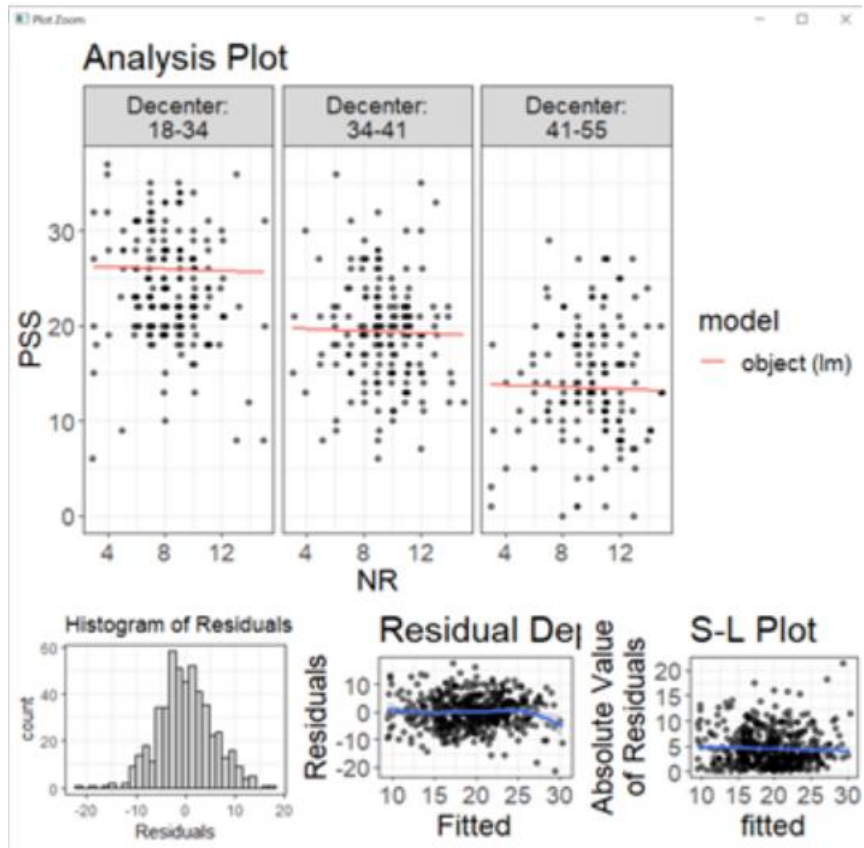
*R Flexplot: Nonjudging and Anxiety*



*Note.* Assumptions of normality, linearity, and homoscedasticity for residuals

**Figure 4**

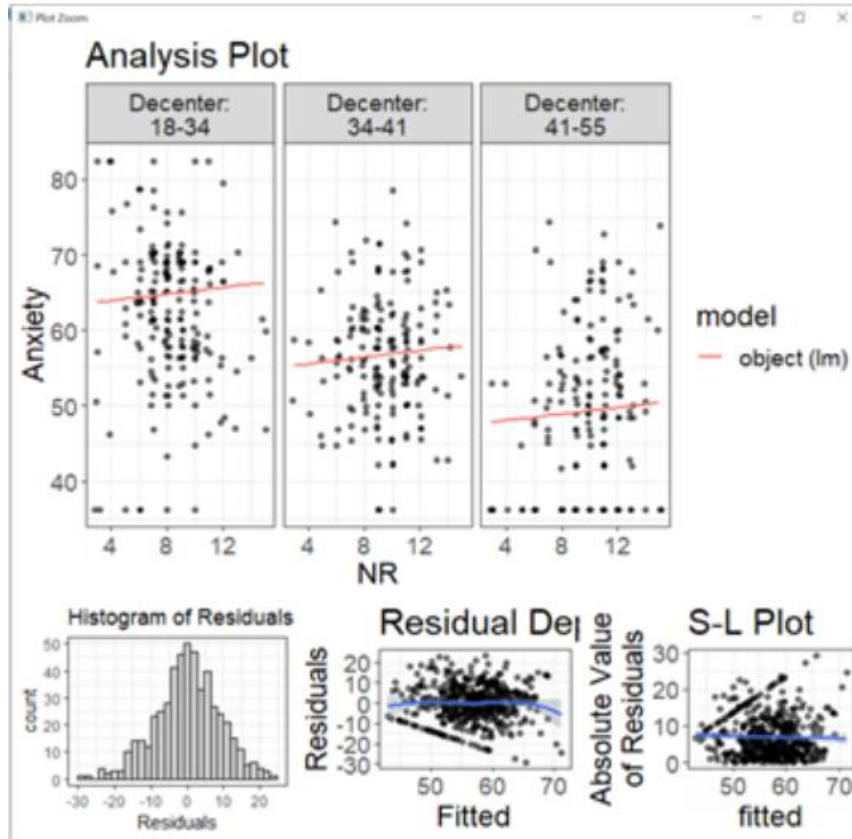
*R Flexplot: Nonreactivity and Stress*



*Note.* Assumptions of normality, linearity, and homoscedasticity for residuals

**Figure 5**

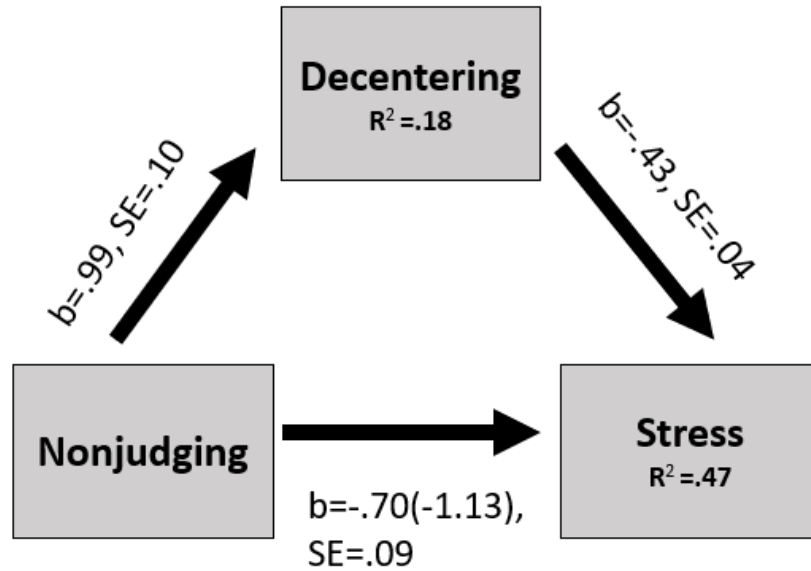
*R Flexplot: Nonreactivity and Anxiety*



*Note.* Assumptions of normality, linearity, and homoscedasticity for residuals

**Figure 6**

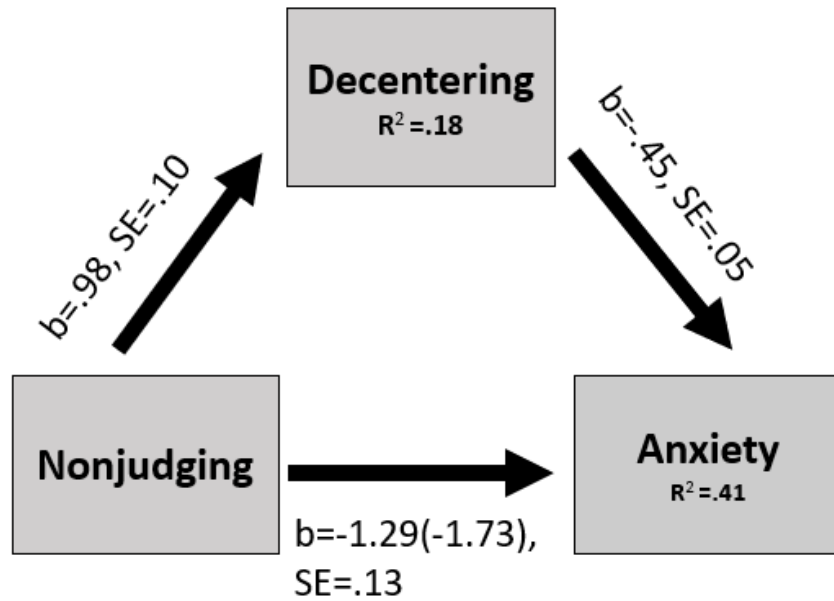
*Decentering Mediates the Relationship between Nonjudging and Stress*



*Note.* Solid lines represent significant findings; ()= total effect

**Figure 7**

*Decentering Mediates the Relationship between Nonjudging and Anxiety*

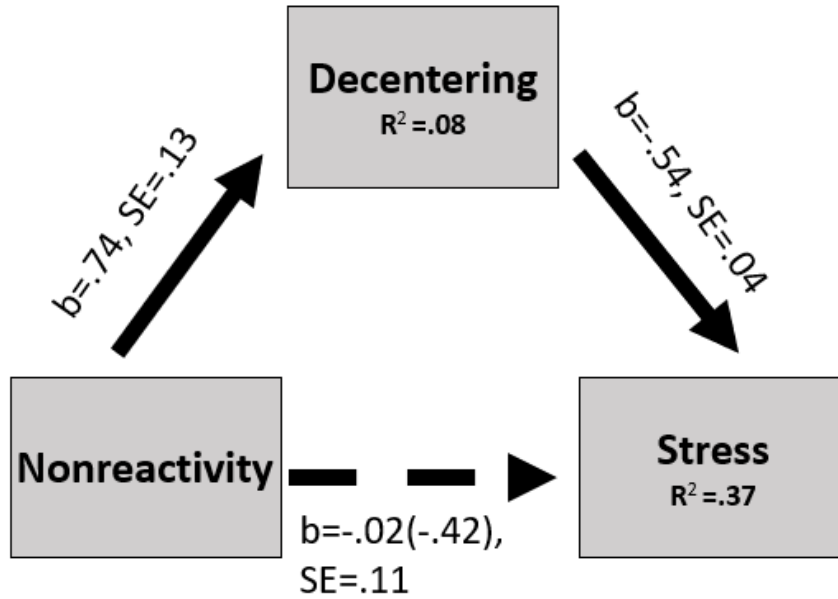


*Note.* Solid lines represent significant findings; ()= total effect



**Figure 8**

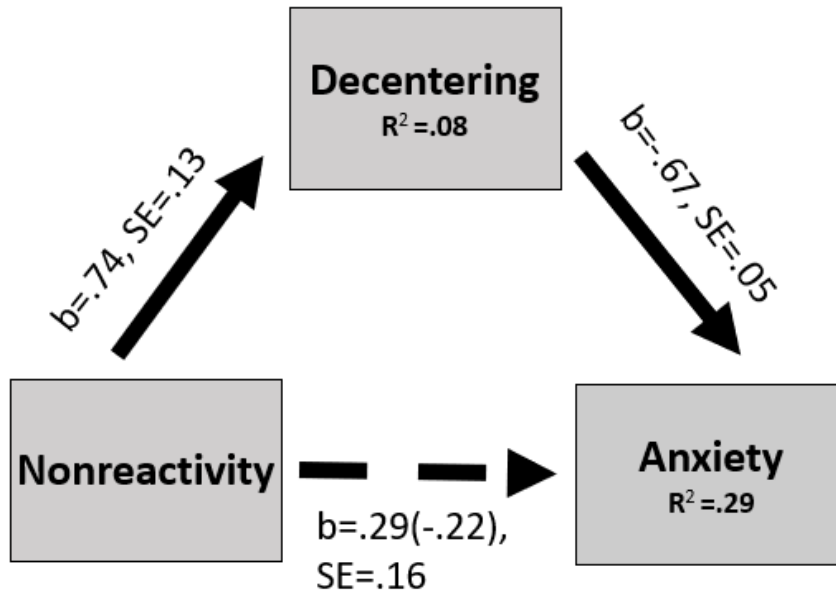
*Decentering Mediates the Relationship between Nonreactivity and Stress*



*Note.* Solid lines represent significant findings; ()= total effect

**Figure 9**

*Decentering Mediates the Relationship between Nonreactivity and Anxiety*



*Note.* Solid lines represent significant findings; ()= total effect

**Table 1***Descriptive Statistics for Scores on Trait Mindfulness, Decentering, and Distress*

<b>Descriptive Statistics</b>					
	Mean/ Normed Mean	Standard Deviation/ Normed SD	Skewness	Kurtosis	Cronbach's Alpha
<b>Mindfulness</b>					
Non-Judging (FFMQ-15)	10.0/10.71	3.1/ 2.44	-0.35	-0.58	0.83
Non-Reactivity (FFMQ-15)	9.10/9.68	2.5	-0.16	-0.47	0.69
<b>Emotion Regulation</b>					
Decentering (Experiences Questionnaire)	37.5/ 37.58 (range 11-55)	7.5/7.6	0.09	-0.25	0.90
<b>Distress</b>					
Perceived Stress (PSS)	19.5 /16.78 (range 0-40)	7.0/ 6.86	-0.09	-0.14	0.87
Anxiety (PROMIS)	56.9/ 50	10.3/ 10	-0.15	-0.27	0.94

**Table 2***Correlations between Trait Mindfulness, Decentering, and Distress*

		<b>Correlations</b>				
		NJ	NR	Decenter	PSS	Anxiety
NJ	Pearson Correlation	1	-.056	.409**	-.483**	-.501**
	Sig. (2-tailed)		.199	<.001	<.001	<.001
	N	531	527	514	521	531
NR	Pearson Correlation	-.056	1	.272**	-.182**	-.092*
	Sig. (2-tailed)	.199		<.001	<.001	.034
	N	527	530	514	520	530
Decenter	Pearson Correlation	.409**	.272**	1	-.598**	-.506**
	Sig. (2-tailed)	<.001	<.001		<.001	<.001
	N	514	514	517	507	517
PSS	Pearson Correlation	-.483**	-.182**	-.598**	1	.652**
	Sig. (2-tailed)	<.001	<.001	<.001		<.001
	N	521	520	507	524	524
Anxiety	Pearson Correlation	-.501**	-.092*	-.506**	.652**	1
	Sig. (2-tailed)	<.001	.034	<.001	<.001	
	N	531	530	517	524	534

\*\* . Correlation is significant at the 0.01 level (2-tailed).

\* . Correlation is significant at the 0.05 level (2-tailed).

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