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Negative Performance Feedback and the Self-Regulatory Benefits of Mindfulness

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by

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DEDICATION

This thesis is dedicated to my parents, Fran Zimmerman and Bernie Slutsky, my sister, Jessica Zimmerman, my grandmother, Dottie Zimmerman, and my soon-to-be wife, Taylor Doaty. Their love and support provided me with the energy, focus, and resilience to push this project to the finish line. I am so lucky to have such a wonderful family and support system. Thank you all for the continuing encouragement and strength.

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ABSTRACT

Past research on negative performance feedback (NPF) has found that self-regulation is key to buffering against negative well-being and performance outcomes. Using feedback intervention theory and mindful self-regulation theory as framework, this study investigated the regulatory effects of mindfulness following the delivery of NPF. Specifically, the relationships between NPF and changes in self-esteem, negative affect, and task performance were examined, as well as the moderating effects of mindfulness on these relationships. The sample consisted of 164 undergraduate students who participated in the virtual experiment in exchange for course credit. Results from the study found that there was no time by condition effect on self-esteem and negative affect. Contrary to predictions, there were significant increases in task performance for both feedback conditions. Furthermore, the mediation and moderated mediation models failed to reach significance. Contributions to the literature as well as implications for future research is discussed.

CHAPTER ONE:

INTRODUCTION

Negative performance feedback (NPF), defined as information about past behavior that fell short of the goal or standard (Ilgen & Davis, 2000), is a routine event in organizations that can play an important role in facilitating performance improvements. For employees to make behavioral adjustments needed for meeting the goal or standard, they first need to be aware that they underperformed (Ilgen & Davis, 2000). Although NPF is a staple in performance management systems (e.g., performance appraisals, 360-degree feedback) that is used to highlight employee shortcomings with the intention of inspiring performance improvement, the performance feedback literature has connected NPF with undesirable psychological and performance-related effects for employees (Belschak & Den Hartog, 2009; Ilgen & Davis, 2000; Ilgen, Fisher, & Taylor, 1979; Kluger & DeNisi, 1996). Research investigating the deleterious effects of NPF has linked different forms of NPF (i.e., destructive NPF and constructive NPF) to a variety of detrimental psychological effects, such as increases in negative affect and decreases in self-esteem, that contribute to various negative work outcomes (destructive NPF; Baron, 1990; Raver, Jensen, Lee, & O'Reilly, 2012; constructive NPF; Eskreis-Winkler & Fishbach, 2019).

The paradox between NPF being intended for use as a developmental tool yet sometimes producing negative outcomes is a work problem that is heavily discussed in the popular press. In 2019 alone, the Harvard Business Review published several articles on the topic, such as, "How Leaders Can Get Honest, Productive Feedback" (Porter, 2019), "The Feedback Fallacy"

(Buckingham & Goodall, 2019), and "How to Be Resilient in the Face of Harsh Criticism" (Grenny, 2019). Unfortunately, these discussions are largely devoid of information from published scientific research that has investigated how employees can minimize the negative impact of NPF. Exploring the efficacy of regulatory strategies that could reduce the detrimental effects of NPF is needed for contributing to these conversations.

This research study aims to contribute to science and practice by investigating the efficacy of mindfulness for reducing the negative effects of NPF. Mindfulness, commonly defined as a non-judgmental and accepting awareness of the present-moment (Brown & Ryan, 2003), has consistently been found to facilitate adaptive responses to adverse events by enhancing cognitive and affective regulation (Arch & Craske, 2006; Brown, Weinstein, & Creswell, 2012; Creswell, Pacilio, Lindsay, & Brown, 2014). Although studies from clinical, health, and social psychology indicate that mindfulness contributes to adaptive responding following adverse events, organizational scholars have conducted relatively little research examining whether these benefits occur in work contexts. Leading scholars on mindfulness and its applications to work have suggested that mindfulness may be particularly helpful for fostering the self-regulation needed to recover from challenging work events (Glomb, Duffy, Bono, & Yang, 2011; Good et al., 2016) and from receiving NPF, specifically (O'Malley & Gregory, 2011). Because the proposed benefits from the self-regulatory processes of mindfulness overlap with the detrimental psychological effects of NPF, an empirical investigation is warranted for documenting whether mindfulness is indeed an effective regulatory strategy for mitigating the unintended consequences of NPF.

Additionally, there are two further reasons that bring merit to the investigation of if and how reactions to NPF are regulated by mindfulness. First, NPF is a necessary and frequently

occurring work event that, if received and processed advantageously, can provide salient developmental value. NPF is intended to help inform employees about the nature of their past performance and identify inappropriate behavior so that they can make the adjustments necessary for closing the performance-standard gap (Audia & Locke, 2003; Ilgen et al., 1979). As technological advances demand employees to develop new skills needed to perform their roles (SIOP, 2019), and NPF is an important component during skill development (Lorenzet et al., 2005), it is imperative that employees appropriately respond to NPF so that they can adapt and evolve with the rapidly changing nature of work.

Second, NPF has important implications for both an employee and the organization. Leading models on NPF suggests that NPF indirectly affects task performance via one's cognitive and affective reactions (Ilgen & Davis, 2000; Kluger & DeNisi, 1996). Performance-resource function theory states that when tasks are resource-sensitive, performance is negatively affected when resources are allocated away from the task (Norman & Bobrow, 1975). Performance feedback scholars suggest that NPF can negatively impact task performance by reallocating resources away from the task through generating self-oriented attention and affective responses (Kluger & DeNisi, 1996). In addition to task performance related outcomes, research suggests that psychological responses to NPF are linked to outcomes related to broader organizational outcomes. Negative affective reactions, in particular, have been found to mediate the relationship between NPF and decreases in organizational commitment and organizational citizenship behaviors, and increases in counterproductive work behavior intentions and turnover intentions (Belschak & Den Hartog, 2009).

With these considerations in mind, the current project has two main objectives. First, this study will test the main effects of two types of NPF (constructive and destructive NPF) on two

psychological processes associated with NPF (state negative affect and state self-esteem). Second, this study will examine the moderating effects of mindfulness on the relationships between NPF and state negative affect and state self-esteem, and the relationship between NPF and task performance mediated by state negative affect and state self-esteem. The current project invokes feedback intervention theory, mindful self-regulation theory, and the performance-resource framework as a foundation for developing predictions on if and how mindfulness contributes to regulated responses following NPF.

Results from this study aims to advance science and practice in three critical ways. First, it will contribute to the literature on performance feedback by investigating a regulatory strategy aimed at reducing the undesirable effects of NPF. Reviews of the performance feedback literature have currently identified individual differences (e.g., self-efficacy, goal orientation, regulatory focus) of the recipient that are associated with positively influencing psychological and behavioral reactions to NPF (Ilgen & Davis, 2000; Ilgen et al., 1979; Kluger & DeNisi, 1996). The study aims to move the literature forward by investigating mindfulness as a regulatory strategy aimed at mitigating the undesirable effects of NPF. By incorporating mindfulness into the performance feedback literature, this research will inform scientists, practitioners, and employees on whether mindfulness is useful for regulating the negative effects of NPF.

Second, by connecting the theoretical link between mindfulness and NPF, this study extends knowledge of mindfulness with regards to its potential behavioral benefits at work. Although scholars have proposed self-regulatory models of mindfulness for explaining potential behavioral benefits at work (Glomb et al., 2011), relatively little research has tested these proposed effects (two notable exceptions are Liang et al., 2018 and Long & Christian, 2015).

Because mindfulness facilitates self-regulation of psychological processes that are relevant to NPF (self-oriented attention and affective reactions), I hypothesize that a brief mindfulness induction will positively impact how individuals behaviorally respond to NPF (smaller decreases in task performance). Exploring this interaction connects the mindfulness and performance feedback literatures as well as further tests theoretical models linking mindfulness to behavioral outcomes at work.

Last, the current project also offers significant practical implications. NPF is a routine event at work and has been linked to negative work outcomes (Belschak & Den Hartog, 2009). Identifying if mindfulness can operate as a protective factor that can be induced through a brief meditation is relevant and important information for practitioners who are aiming to improve organizations in fast-paced and competitive industries. Tech, for instance, is one industry where some organizations have cultures that encourage blunt and candid NPF (Ramachandran & Flint, 2018). Put together, this study aims to make impactful contributions to the performance feedback and mindfulness literatures as well as provide relevant information to practitioners by examining mindfulness as a moderator on the relationship between two types of NPF (constructive and destructive) on changes in negative affect, self-esteem, and task performance.

Negative Performance Feedback

Early research on performance feedback was generally thought to always facilitate improved performance. The law of effect (Thorndike, 1913) assumed that positive performance feedback (PPF) reinforces correct behavior and NPF punishes incorrect behavior. This hypothesis reigned supreme until the latter half of the 20th century, when it was suggested that the law of effect was insufficient for explaining the relationship between performance feedback and performance. Meta-analytic results found a meager relationship between amount of feedback

and performance (r = .07; Harris & Rosenthal, 1985), suggesting that there may be nuances to the relationship. In 1996, Kluger and DeNisi introduced feedback intervention theory (FIT) to provide a more comprehensive explanation for variance in performance feedback effects. FIT encompasses components from control theory (Carver & Scheier, 1981) and goal setting theory (Latham & Locke, 1991) to explain observed inconsistencies in the effects of performance feedback on performance. Although this theory applies to inconsistencies when both PPF and NPF are delivered, I will discuss FIT in the context of NPF due to the scope of this research project.

FIT's main theoretical contribution explains when and how performance feedback improves or debilitates performance. A novel argument from FIT that is critical for understanding the feedback-performance relationship states that feedback changes the recipient's locus of attention and therefore affects their behavior (Kluger & DeNisi, 1996). FIT states that there are three main levels of attention: task-learning processes (details of the task), task-motivation processes (task strategy), and meta-task processes (the self). FIT submits that attention is normally directed to a moderate level of the hierarchy (task-motivation processes), however, NPF cues may redirect attention up the hierarchy towards the self (Kluger & DeNisi, 1996).

FIT posits that NPF cues directing attention towards the self can produce superior performance only when the task is simple or if the recipient of NPF can redirect attention back down to the task-motivation or task-learning level. Otherwise, FIT states that attention directed towards the self can be debilitating for performance, especially when the task is complex. FIT's justification for how feedback effectiveness is inhibited when NPF triggers self-oriented attention (Kluger & DeNisi, 1996) is based upon the performance-resource framework developed

by Norman and Bobrow (1975). The performance-resource framework states that performance is largely contingent upon the amount of cognitive resources devoted to the task (Norman & Bobrow, 1975). Past research aiming to investigate the NPF, self-oriented attention, and resource-sensitive task relationship manipulated self-oriented attention by randomizing participants to either an affirmation (write list of personal achievements) or no-affirmation condition (triggering self-oriented attention by maximizing self-concept discrepancy) following bogus NPF (Vancouver & Tischner, 2004). The study's results found that participants in the NPF and high self-concept discrepancy condition had lower task performance than those in the NPF and low self-concept discrepancy condition only when performing the resource-sensitive task (Vancouver & Tischner, 2004). These results support FIT's predictions by suggesting that feedback effectiveness is inhibited when NPF redirects resources away from the task but only on tasks that require high levels of cognitive resources.

Another tenet of FIT states that self-oriented attention triggers negative affective reactions (Kluger & DeNisi, 1996). The process by which NPF leads to negative affect can be explained by the recipient's cognitive appraisal of the event as failing to achieve one's goals. Cognitive appraisal theorists suggest that individuals initially appraise events (primary appraisal) based on their relevance to one's personal goals (Smith & Lazarus, 1991). The personal goal that one attaches relevance to is central to the elicitation of an affective reaction (Smith & Lazarus, 1991). If an event is relevant to an important personal goal and one assesses that they do not have the capacity to immediately reduce the discrepancy between the event and one's goal (secondary appraisal), negative affective reactions are elicited (Smith & Lazarus, 1991). Given that individuals inherently view themselves as having positive attributes (Higgins, 1987), NPF likely generates negative affective reactions through appraisals of non-goal attainment (failure to

demonstrate competency) and doubts regarding one's ability to immediately reduce the performance-goal discrepancy. Laboratory experiments have indeed found a positive relationship between NPF and negative affect when NPF threatens one's personal goals (Ilies et al., 2007; Raver et al., 2012).

Like self-oriented attention, negative affect has implications for task performance. Again through a resource allocation perspective, scholars suggest that when individuals experience negative affect, cognitive resources are reallocated toward affective regulation, resulting in less resources dedicated to task performance (Beal et al., 2005; Kluger & DeNisi, 1996). For example, an employee might be dividing their attention between the current task and ruminating on or reappraising the previously received NPF, thereby limiting one's cognitive resources directed towards the task. In the organizational psychology literature, there is both theoretical (Beal et al., 2005) and empirical (Koy & Yeo, 2008; Lam et al., 2011) support for the negative relationship between state negative affect and performance on cognitively demanding tasks.

Delivering Negative Performance Feedback

Performance feedback scholars suggest that the delivery of NPF is important for influencing how one cognitively and affectively reacts to NPF (DeNisi & Kluger, 2000; Kluger & DeNisi, 1996). Constructive and destructive NPF are two common forms of delivering NPF that have implications for altering cognitive processes and eliciting affective reactions. Constructive NPF is characterized as specific and considerate in nature and includes concrete evidence where recipients made an error or inadequately performed a task (Baron, 1988). Constructive NPF has been linked with positive effects on performance (in particular when the deliverer of NPF displays positive affect; Gaddis, Connelly, & Mumford, 2004). Although constructive NPF has been found to yield positive performance effects and is also what most

employees prefer to receive (Ilgen, Mitchell, & Frederickson, 1981), the literature suggests that recipients of constructive NPF do not always respond effectively to this type of feedback. Recent research found that relative to success feedback (feedback stating that the answer was correct), constructive NPF (feedback stating that the answer was incorrect and providing the participants with information of the correct answer) can be detrimental to performance (fewer words correct on a language learning task compared to the positive feedback condition) via undermining self-esteem (Eskreis-Winkler & Fishbach, 2019), as well as lead to lower task performance (fewer correct answers on law school admissions practice problems compared to the positive feedback condition) for depleted individuals (Ruttan & Nordgren, 2016).

Destructive NPF is characterized as biting, sarcastic in tone, and attributes poor performance to one's abilities (Baron, 1988). Destructive NPF is relatively common in the workplace (Glomb, 2002; Neuman & Baron, 1998) and often occurs when employees want to inflict harm to colleagues. Recipients of destructive NPF are likely to generate stronger internal negative responses than when receiving constructive NPF. Research has found that destructive NPF elicits higher levels of negative affective responses than constructive NPF (Baron, 1988, 1990; Raver et al., 2012). It is also expected that destructive NPF will be perceived as more threatening to the self than constructive NPF. Destructive NPF by nature more directly threatens the self by specifically ascribing one's poor performance to one's attributes. Related research found that participants reported lower levels of self-efficacy after receiving destructive NPF than receiving constructive NPF (Baron, 1988, 1990).

In the current study, I operationalize self-oriented attention as self-esteem threat (indicated by decreases in state self-esteem). This operationalization of self-oriented attention is consistent with how Kluger and DeNisi (1996) operationalized it in their meta-analysis (self-

esteem threat was coded as an NPF cue that directs attention to the self). Consistent with previously discussed research and theory, I hypothesize:

Hypothesis 1: There will be greater decreases in state self-esteem after destructive NPF is provided than when constructive NPF is provided.

Hypothesis 2: There will be greater increases in state negative affect after destructive NPF is provided than when constructive NPF is provided.

As discussed earlier, a main tenet of FIT states that feedback that directs attention away from the task and towards meta-task processes (self-esteem threat and affective reactions) can be debilitating for task performance (Kluger & DeNisi, 1996). Because previous research found that these effects are more pronounced in destructive NPF (Baron, 1988, 1990), I predict that there will be greater decreases in task performance for the destructive NPF condition compared to the constructive NPF condition. Furthermore, consistent with FIT and the performance-resource framework, I predict that the expected cognitive and affective reactions to NPF (decreases in state self-esteem and increases in state negative affect) will mediate the relationship between NPF and decreases in performance.

Hypothesis 3: There will be greater decreases in task performance after destructive NPF is provided compared to when constructive NPF is provided.

Hypothesis 4a: Decreases in state self-esteem will mediate the relationship between NPF and decreases in task performance.

Hypothesis 4b: Increases in state negative affect will mediate the relationship between NPF and decreases in task performance.

As previously articulated by performance feedback theorists, responses to NPF are not solely dictated by the nature of feedback. Rather, the interaction between feedback characteristics and recipient characteristics is also important for predicting how one will respond to NPF (Ilgen & Davis, 2000; Ilgen et al., 1979; Kluger & DeNisi, 1996). In the next section, I discuss how mindfulness might interact with NPF to alter one's psychological and behavioral responses.

Mindfulness and Self-Regulation

Mindfulness, described as a non-judgmental awareness of the present moment (Brown et al., 2007), has received a large amount of interest in recent years. In the mindfulness and organizational sciences literature, mindfulness has been operationalized as a trait, state and practice (Good et al., 2016). Trait mindfulness describes one's average tendencies of being mindful across days (Brown & Ryan, 2003). State mindfulness refers to actively and intentionally processing present-moment experiences in a mindful manner (Lau et al., 2006). Mindfulness practice relates to participating in attention focusing activities intended to improve the capacity to create more mindful states (Kabat-Zinn, 2006). For the purpose of examining whether mindfulness moderates immediate, within-person reactions to NPF, I will operationalize mindfulness as a state form induced through a brief mindfulness meditation.

Mindful self-regulation theory, developed by Glomb and colleagues (2011), provides a useful lens through which to view how mindfulness helps regulate reactions to adverse events at work. This model has been used by mindfulness scholars to examine how mindfulness may be beneficial for a variety of work-related situations, such as managing emotional job demands (Hülsheger et al., 2013) and inhibiting retaliatory behaviors following workplace injustice (Long & Christian, 2015). Mindful self-regulation theory states that two core processes of mindfulness,

decoupling of the self and decreased automaticity of mental processes, are key for cognitive and affective regulation following negative work experiences (Glomb et al., 2011).

Decoupling, a core regulatory process of mindfulness discussed in Glomb et al.'s model, involves creating a separation between the self and events, emotions and experiences (Glomb et al., 2011). Through this process, mindfulness helps individuals observe external stimuli as objective information without evaluating or assigning meaning to it (i.e., reflection of one's self-worth). This regulatory process may benefit individuals receiving NPF because receiving NPF is a circumstance where there is potential to reflect information from NPF onto the self (Kluger & DeNisi, 1996). Research indirectly suggests that decoupling is a process that may be developed through a mindful induction. One study found that a 5-minute mindfulness induction significantly reduced aggressive behavioral responses relative to the control condition following a social rejection manipulation (Heppner et al., 2008). Although decoupling was not directly measured, the study's authors suggest that a reduction in ego involvement (synonymous with decoupling) was the psychological process that helped drive the outcome.

The other core process in mindful self-regulation theory is deautomaticity. Automaticity describes automatic, habitual thought patterns (Chaiken, 1980). Although automaticity provides mental efficiency, it decreases one's awareness and control of one's responses (Bargh, 1994). Through the regulatory process of deautomaticity, mindfulness helps one disengage with one's automatic thought processes, thereby allowing one to consciously redirect one's cognitive processes towards one's goals. Deautomaticity may be helpful when receiving NPF, because automatic affective responses and self-evaluation can undermine subsequent task performance (Kluger & DeNisi, 1996). Previous research found that deautomatization can be developed through a mindful induction. One study randomized participants to either a 20-minute

mindfulness induction or a resting control and found that participants in the mindfulness induction significantly reduced habitual responding on the Stroop task compared to the control (Wenk-Sormaz, 2005).

Mindful self-regulation theory suggests that decoupling in particular is a self-regulatory core processes of mindfulness that is helpful for mitigating threats to the self (e.g., self-esteem, self-concept, self-identity) following adverse events (Glomb et al., 2011). One study investigating the regulatory benefits of mindfulness induced a stereotype threat in female participants by informing them that they were participating in a study exploring why males are better than females at math (Weger, Hooper, Meier, & Hopthrow, 2012). Those that completed a 5-minute mindfulness induction prior to the manipulation performed significantly better on the math task than the control condition. The authors of the study suggest that mindfulness detached threat from the social comparison cues ("It is possible that mindfulness dissociates the cues linked to social comparison from their threatening value"), which in turn, helped enhance task-related cognitive functioning.

Based on the aforementioned theoretical model and empirical evidence suggesting that mindfulness helps regulate self-esteem threat, I predict that mindfulness will moderate the relationship between NPF and state self-esteem such that there will be less of a decrease in state self-esteem for those in the mindfulness condition than for those in the control condition.

Hypothesis 5: Mindfulness moderates the relationship between NPF and change in state self-esteem such that there is less of a decrease in state self-esteem for those in the mindfulness condition than for those in the control condition.

Mindfulness should also mitigate negative affective reactions to NPF. Through decoupling, mindfulness helps one expose themselves to negative events without identifying with and relating the events to the self, thereby reducing affective responses (Leary & Diebels, 2017). Previous research found that a 3 minute and 45 second mindfulness induction significantly reduced levels of negative affect relative to the control group following a mood induction in which participants were asked to write about a conflict with someone that was very important to them (Ortner & Zelazo, 2014). Furthermore, a recent meta-analysis found that mindfulness inductions are superior to comparison groups (i.e., mind wandering, distraction) for regulating negative affect (d = -.28) and that the effect of mindfulness on negative affect was significant when the negative mood inductions were personally relevant (Leyland et al., 2019). The empirical (autobiographical recall of conflict with someone that was personally important) and meta-analytical (stronger effects of mindful inductions regulating personally relevant mood inductions) research provides indirect support that the decoupling process (separating the self from experiences) of mindfulness helps regulate affective reactions to adverse events.

Mindfulness should also help reduce negative affect through deautomatizing affective responses following NPF. Appraisal theorists posit that the primary appraisal process of affective generation is conducted automatically (Smith & Kirby, 2001). Mindfulness may deautomatize primary appraisals of emotional events by making neutral evaluations without self-reference rather than automatically appraising NPF as an obstruction to a self-relevant goal (Good et al., 2016). Neuroimaging research supports the proposition that mindfulness interferes during the appraisal stage of processing emotional events. One study found that those who effectively engaged in a 15-minute mindfulness induction recorded significantly lower neurophysiological responses relative to the control group 300-500 milliseconds after exposure to negative images

when compared to neutral images (Eddy et al., 2015). By deautomatizing the processing of NPF, mindfulness should help mitigate one's affective responses.

Because of the previously detailed evidence suggesting that the decoupling and deautomatizing processes of mindfulness regulates affective reactions, I expect that, compared to the mindfulness condition, there will be significantly greater increases in state negative affect for the control condition following the delivery of NPF.

Hypothesis 6: Mindfulness moderates the relationship between NPF and change in state negative affect such that there is less of an increase in state negative affect for those in the mindfulness condition than for those in the control condition.

Mindfulness, Self-Regulation, and Performance

As supported by Kluger and DeNisi's (1996) meta-analysis, FIT states that performance on complex tasks can be debilitated when feedback directs cognitive resources away from the task. This theory is consistent with other theoretical models examining within-person performance variability (Beal et al., 2005; Kanfer & Ackerman, 1989). Resource allocation theory states that one must allocate their full cognitive resources towards a task to achieve successful performance when the task requires maximal cognitive resources (Kanfer & Ackerman, 1989). Beal and colleagues' (2005) episodic performance model also suggests that within-person performance variance is influenced by one's coexisting levels of attentional control and affective state.

Mindfulness is expected to help maintain cognitive resources directed towards the task by reducing perceptions of self-esteem threat. Given that previous research found that self-esteem threat mediates the relationship between NPF and task performance (Eskreis-Winkler &

Fishbach, 2019), and mindfulness is theorized to mitigate self-referential thoughts following threatening events (Glomb et al., 2011), I predict that the indirect effect of self-esteem threat on task performance will be smaller for the mindfulness condition than the control condition.

Affective reactions also redirect cognitive resources away from the task and thereby interferes with task performance (Beal et al., 2005). Previous research suggests that brief mindfulness meditation helps with both buffering affective reactions as well as efficiently recovering from affective experiences (Keng et al., 2013). These effects are thought to preserve cognitive resources and explain improved performance on the Stroop task relative to control conditions (Keng et al., 2013). Building upon previous hypotheses, I expect that the moderating effects of mindfulness will carry through to task performance, such that the indirect effects of state negative affect and state self-esteem on task performance will be weaker relative to the control group.

Hypothesis 7a: Mindfulness moderates the indirect effect of NPF on task performance through decreases in state self-esteem, such that the negative indirect effects are weaker for the mindfulness condition than the control condition.

Hypothesis 7b: Mindfulness moderates the indirect effect of NPF on task performance through increases in state negative affect, such that the negative indirect effects are weaker for the mindfulness condition than the control condition.

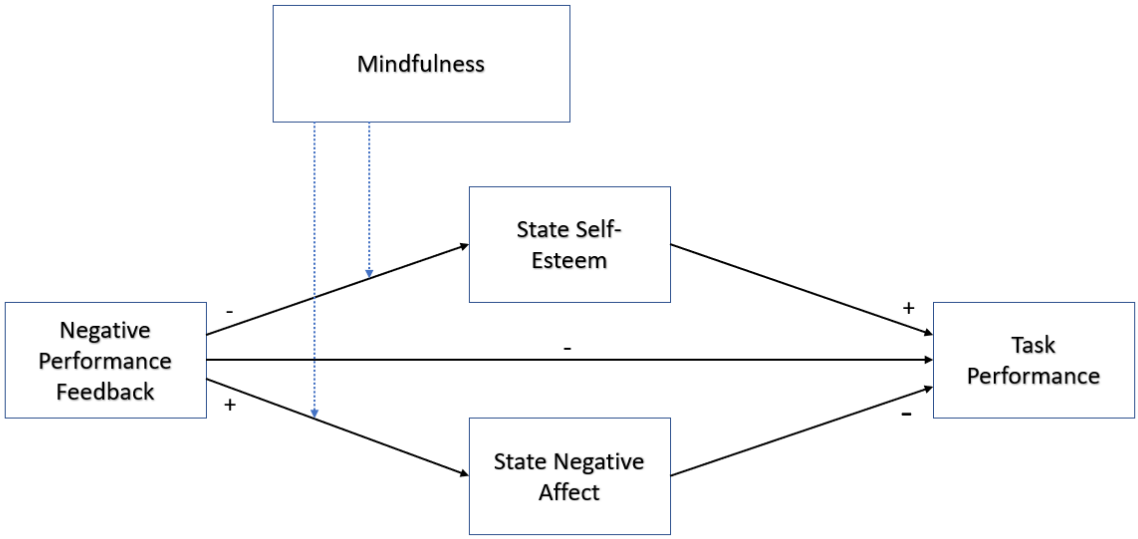


Figure 1. Depiction of Hypothesized Relationships

CHAPTER TWO:

METHOD

Participants

Participants were recruited via the University of South Florida psychology department's online SONA participant pool. Sample size was determined using a statistical power analysis using G*Power 3.1.9.4 (Faul et al., 2009). The power analysis was based on the ability to detect additional variance accounted for by the proposed two-way interaction terms. Results from the power analysis indicated that a sample of 159 would be needed to detect a small-to-medium effect ($\Delta R^2 = .05$) with power = .80 and $\alpha = .05$. To be conservative and account for potential problems with the data, 170 participants were recruited and participated in the study. Data from 6 participants were removed leaving a final sample size of 164. One participant did not finish the experiment, 3 participants correctly guessed the deception used during the study debrief, 1 participant misunderstood the instructions in the performance task, and 1 participant completed the survey questions in the incorrect order. Of the final sample, the mean age was 20.8 (SD = 4.2), the majority of participants were female (67.1%), and 40.9% identified as White or Caucasian, 26.8% as Hispanic or Latino, 12.8% as African American, Black or Afro-Caribbean, 11.6% as Asian/Pacific Islander, and 7.9% as other.

Materials

Task Performance

Participants performed the Remote Associates Test (RAT; Mednick, 1962), a task that assesses creative performance and has been commonly used in research studies that involve illusory feedback (McFarlin & Blascovich, 1984). The RAT was chosen for the proposed study because the difficulty can be manipulated in such a way that the NPF is more likely to coincide to the participant's actual performance and therefore becomes credible.

In the RAT, participants were given a set of three words and were told that it is their job to find a fourth word that serves as an associative connective link between the provided set of words. Participants were asked to complete all 15 sets of words in 4 minutes across 2 performance trials. A mixture of difficulty levels was chosen for the task (7 very hard items, 3 hard items, 5 medium items). Prior to starting the performance trial, participants completed 3 practice rounds with me. The RAT words for both performance trials are found in Appendix A. The cover story for the performance task is found in Appendix E and the instructions for the RAT task is found in Appendix F.

Mindfulness Induction

State mindfulness was induced using an 8-minute guided meditation from an audio recording used in previous research by Hafenbrack and Vohs (2018). This exercise instructs participants to bring awareness to their thoughts, feelings, and sensations in the present moment. Furthermore, the mindfulness instructor in the audio recording directs participants to focus their awareness on their breath while refraining from making any judgments or elaborative thoughts.

This induction has consistently been found to induce higher levels of state of mindfulness relative to a control condition (Hafenbrack & Vohs, 2018).

Mind-Wandering Induction

The control condition listened to an 8-minute audio recording that was also previously used in Hafenbrack and Vohs's (2018) study. In this audio recording, participants were instructed to let their mind wander for 8 minutes. In between periods of silence, the instructor encourages participants to let their mind go wherever their thoughts take them. This induction has consistently been found to induce lower levels of state of mindfulness relative to mindfulness conditions (Hafenbrack & Vohs, 2018).

The mind wandering induction was chosen as the control condition for two reasons. First, a no-induction control group would introduce length of the study and differences in fatigue as confounding variables. There would be less certainty surrounding the study results if the results were influenced by group differences in fatigue, comfort in the study setting, or other variables related to time spent in the study. Second, using a mind wandering induction as the active control condition is more conservative than a no-induction control condition. Variables that may influence self-esteem, affect, or performance such as comfort in the study environment and relaxation are being accounted for through the mind wandering induction. Through this logic, any effects found will be above and beyond these potential confounding variables and more confidence can be given to attributing these effects to the mindfulness induction.

NPF Manipulations

NPF was delivered consistently with how Baron (1988; 1990) describes constructive NPF (specific in content and considerate in tone) and destructive NPF (general, inconsiderate in tone,

and attribute poor performance to internal factors). The script for constructive NPF was: "You scored in the 28th percentile of all participants that have completed this task. There is room for improvement. Focus more on associating the set of words." The script for the destructive NPF was: "You scored in the 28th percentile of all participants that have completed this task. It does not seem like you tried. Maybe you are just poor at creative thinking." The 28th percentile has been previously used in the performance feedback literature for a NPF manipulation (Ruttan & Nordgren, 2016).

Measures

The full set of items for all survey measures is presented in Appendices B-D.

State Negative Affect

State negative affect was measured using ten items from the negative affect scale of the Positive and Negative Affect Schedule (Watson et al., 1988). Past research has used this scale in performance feedback studies (Ilies et al., 2007; Koy & Yeo, 2008). A sample item is "Right now (that is, at the present moment) I feel: Upset." Responses were given on a five-point Likert scale that ranged from *very slightly or not at all* to *extremely*; Time 1 $\alpha = .85$, Time 2 $\alpha = .81$.

State Self-Esteem

State self-esteem was measured using five items from the performance subscale of the Self-Esteem Scale (SSES; (Heatherton & Polivy, 1991)). This scale was used previously in performance feedback research (Britt et al., 2010). A sample item is "I feel confident about my abilities." Responses were given on a five-point Likert scale that ranged from *not at all* to *extremely*; Time 1 $\alpha = .72$, Time 2 $\alpha = .87$.

Task Performance

Task performance on the RAT was measured by the total number of correct words found in each performance trial. Scores for each performance trial could range from 0 to 15.

Mindfulness Induction Check

Participants completed two sets of three manipulation check items used in previous mindfulness research (Hafenbrack & Vohs, 2018) to determine if a mindful state was induced. One set measured physiological awareness ($\alpha = .77$). The physiological awareness items included "to what extent are you currently focused on your breathing," "to what extent are you currently focused on physical sensations," and "to what extent are you currently in touch with your body." The other set measured present-moment focus ($\alpha = .86$). The present-moment focus items included "to what extent are you currently absorbed in the present moment," "to what extent are your thoughts focused on the present moment," and "to what extent are you currently thinking about the present moment." Responses were given on a five-point Likert scale that ranged from *very slightly or not at all* to *extremely*.

NPF Manipulation Check

Participants completed the four-item constructiveness subscale of the Negative Feedback Dimensions Scale (NFDS; (Chory & Kingsley Westerman, 2009) to determine if the NPF manipulations were successful. Items include "in communicating the feedback to me, my experimenter was harsh/gentle," "uncaring/caring," "insensitive/sensitive," and "disrespectful/respectful", and responses were assessed on seven-point differential scales; $\alpha = .94$.

Demographics

Demographic variables included age, race, sex, and previous mindfulness experience.

Procedure

I was the experimenter for each session and Microsoft Teams was used as the platform for all video calls. I had my camera turned on and background blurred for each call. I requested participants to turn on their cameras for the duration of the study. Participants obliged except during select occasions when technical difficulties occurred (i.e., turning on the camera interrupted their Internet connectivity). When participants were asked to complete a survey measure, performance task, or engaged in the mindfulness/mind-wandering induction, I turned off my camera and muted my microphone so as not to disrupt or distract the participant.

The study began when the participant entered the video call. I greeted the participants and thanked them for signing up for the study. Next, I described the premise of the study as an experiment investigating the effects of relaxation on performance. This cover study was used to mitigate any bias surrounding mindfulness, specifically. Next, I outlined the format of the study (performing a task, completing survey questions, and engaging in an audio-guided relaxation) and administered informed consent.

After participants agreed to participate in the study, they completed the first round of the self-report measures. Next, I presented participants with the instructions for the RAT and then they completed 3 practice rounds of the RAT with me. Next, participants completed the first 4-minute trial of the RAT. Participants were asked to share their screen while completing the performance task so that I could "score" their performance at the end (this was intended to further boost the NPF deception).

After completing the RAT task, I delivered one of two feedback manipulations. I informed all participants that they scored in the 28th percentile in a considerate (constructive NPF) or rude manner (destructive NPF). Next, participants completed either an 8-minute mindfulness or mind-wandering induction (from Hafenbrack & Vohs, 2018). After the 8-minute period, participants completed a manipulation check (two Likert scales for reporting the extent to which they are focused on the present moment and focused on their breathing) followed by the second round of self-report measures. Next, participants completed the second trial of the RAT. Lastly, participants completed the performance feedback manipulation check, the demographic items, and were debriefed (see Appendix G for debrief script) and thanked for their participation. See Appendix H for a visual representation of the study's procedure.

Randomization Procedure

To effectively conduct random assignment to study conditions, I generated a list of random numbers through the website, Randomizer.org. Initially, 2 lists of 175 digits were created with numbers that ranged from 1 to 2. Each list had digits that represented the mindfulness or control conditions and constructive or destructive NPF conditions. After 114 participants were run, it appeared that the sample sizes across the conditions were becoming disproportionate (mindfulness and constructive NPF: 31, control and constructive NPF: 24, mindfulness and destructive NPF: 35, control and destructive NPF: 24). To balance the number of participants across samples, participants were randomly assigned to either the control and constructive NPF, control and destructive NPF, or mindfulness and constructive NPF conditions until there were 35 participants in each group. Next, one list of 35 digits were generated from Randomizer.org with numbers that ranged between 1 and 4 to represent the four conditions. The number 1 represented the constructive NPF and mindfulness induction condition, 2 represented

the constructive NPF and mind wandering condition, 3 represented the destructive NPF and mindfulness induction condition, and 4 represented the destructive NPF and mind wandering induction. This list of generated numbers was then pasted next to the remaining list of participant IDs (240-275) on the Google Drive master list spreadsheet. For each session, I would wait for the participant to begin working on the first performance task before opening the randomization spreadsheet and viewing the random assignment condition that was matched with the participant's ID. Multiple analysis of variances (ANOVAs) and chi-square tests were conducted to assess successful randomization among groups. Results from these analyses indicated that there were no significant differences between groups among demographic variables, previous mindfulness practice, and main study variables assessed prior to the manipulations ($ps > .05$; see Table 1 for full results).

Table 1. *Descriptive Statistics and Mean Difference Tests Results of Demographics Variables and Main Study Variables at Time 1*

	Constructive NPF and Mindfulness Induction		Constructive NPF and Control Induction		Destructive NPF and Mindfulness Induction		Destructive NPF and Control Induction		
Variable	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	
Demographics									*f-value*
Age	20.80	4.14	21.68	5.23	20.76	4.56	20.05	2.44	1.20
Previous mindfulness experience	1.93	0.93	2.30	1.09	2.15	1.17	2.05	0.96	0.08
Main study variables									*f-value*
Negative Affect (Time 1)	1.32	0.33	1.38	0.52	1.37	0.50	1.44	0.49	1.19
Self Esteem (Time 1)	3.94	0.67	3.93	0.58	3.95	0.58	3.82	0.52	0.65
Task Performance (Time 1)	2.49	2.11	2.67	1.85	2.66	2.04	2.48	1.90	0.00
Demographics	*%*		*%*		*%*		*%*		χ^2*-value*
% Female	75.61		57.50		70.73		64.29		1.27
% White	36.59		50.00		36.59		40.48		0.40
Sample Size	41	41	40	40	41	41	42	42	

CHAPTER THREE:

RESULTS

Preliminary Analyses

Data cleaning, descriptive statistics, assumption checks, and manipulation checks were conducted using the statistical computing software R (R Core Team, 2019). Means, standard deviations, skewness, and kurtosis, of primary study variables were computed using the 'psych' package (Revelle, 2020) and are presented in Table 2 for the overall sample. The values for skewness and kurtosis revealed that there were non-normal distributions for negative affect, task performance, feedback manipulation check, and previous mindfulness practice. Given that the nature of these variables typically yields skewed distributions, I proceeded to continue with the planned analyses. As a post-hoc robustness check, I conducted all of the reported analyses after log transforming the dependent variables. Results from this robustness check indicated that the log transformation did not substantively change any of the conclusions.

An examination of boxplots for the main study variables revealed some significant outliers. Values were extracted for the lower (Q1 − 1.5*interquartile range) and upper (Q3 + 1.5*interquartile range) whiskers on the boxplots for each measure. Thirteen outliers were identified on the negative affect measure at Time 1 (values between 2.1-3.6), six outliers were identified on the negative affect measure at Time 2 (values between 2.5-3.2), two outliers were identified on the self-esteem measure at Time 1 (values were 2.0 and 2.2), zero outliers were identified on the self-esteem measure at Time 2, two outliers were identified on the task

performance measure at Time 1 (values were 9 and 10), and three outliers were identified on the task performance measure at Time 2 (values were 11, 12, and 13). Given that the range of outlier scores for each measure were considered plausible, all participants and their responses were included in the analyses. As a post-hoc robustness check, I conducted all of the reported analyses after removing responses that were identified as outliers using both the non-normal and log transformed data. Results from this robustness check indicated that removing outlier data did not substantively change any of the conclusions.

Means and standard deviations of primary study variables for the full study sample and by experimental condition are provided in Tables 2-4. Correlations among variables are presented in Table 5. Mindfulness and feedback manipulation checks were assessed using ANOVAs. Results indicate that participants in the mindfulness condition reported greater physiological awareness ($M = 3.37$, $SD = 0.78$) than the participants in the mind wandering control condition ($M = 3.01$, $SD = 0.98$) ($F(1,162) = 7.13$, $p < .001$). Participants in the mindfulness condition also reported greater present moment focus ($M = 3.66$, $SD = 0.77$) than the participants in the mind wandering control condition ($M = 3.41$, $SD = 0.87$) ($F(1,162) = 3.86$, $p < .05$). Furthermore, the results indicate that participants in the constructive NPF condition ($M = 6.77$, $SD = 0.73$) rated the experimenter as significantly more constructive than the destructive NPF condition ($M = 6.07$, $SD = 1.22$) ($F(1,162) = 20.22$, $p < .001$). Thus, both manipulations were deemed successful.

Hypothesis Testing

The following analyses were conducted using SPSS (IBM Corp., 2017). Wilks' Lambda was assessed for all MANOVAs and follow-up univariate tests. Hypotheses 1-3 were tested using a repeated measures MANOVA with NPF as an independent variable and self-esteem,

negative affect, and task performance at Time 1 and Time 2 as dependent variables. Results from the 2 (constructive and destructive NPF) by 2 (pre and post NPF manipulation) MANOVA did not find significant support for the measure*time*feedback effect (F (2,161) = 1.54, p = .22), indicating that change in the dependent variables did not differ between the constructive and destructive NPF groups (full results of the MANOVA are presented in Table 6). Mauchly's Test of Sphericity indicated that the within-subjects effects of measure (W = 0.48, p < .01) and measure by time (W = 0.54, p < .01) violated the assumption of sphericity (variances in group differences were not equal). The measure*time*feedback effect was still nonsignificant after correcting for sphericity. Follow-up univariate tests for Hypotheses 1-3 were conducted using a Bonferroni corrected alpha level of .0167 (.05/3).

Hypothesis 1 stated that there would be greater decreases in self-esteem after destructive NPF was provided than when constructive NPF was provided. Results from the follow-up univariate test indicated that change in self-esteem did not significantly differ between the constructive and destructive NPF groups (F (1,162) = 0.07, p = .79). Hypothesis 2 stated that there would be greater increases in negative affect after destructive NPF was provided than when constructive NPF was provided. When taking into consideration the Bonferroni correction, results from this univariate test did not find support for Hypothesis 2 (F (1,162) = 5.28, p = .02), indicating that changes in negative affect did not significantly differ across feedback conditions. Hypothesis 3 stated that there would be smaller increases in task performance after destructive NPF is provided compared to when constructive NPF is provided. The univariate test did not find support for Hypothesis 3 (F (1,162) = 1.13, p = .29). Furthermore, contrary to predictions, both the constructive NPF group (M = 2.58, SE = .22 at Time 1, M = 3.54, SE = .24 at Time 2) and the

destructive NPF group (M = 2.57, SE = .22 at Time 1, M = 3.18, SE = .28 at Time 2) reported significant increases in task performance from pre to post-NPF (F (1, 162) = 23.19, p < .01).

Hypotheses 4a and 4b stated that decreases in self-esteem and increases in negative affect would mediate the relationship between NPF and increases in task performance. These hypotheses were tested using the PROCESS macro for SPSS (Hayes, 2017). The PROCESS macro provides estimations of the indirect and conditional effects through the comparison of bootstrapped confidence intervals (considered nonsignificant if the intervals include zero). All bootstrapping tests were run using 5000 iterations. NPF was entered as the independent variable, self-esteem and negative affect composite scores at Time 2 were entered as the mediator variables, and performance composite scores at Time 2 was entered as the dependent variable. Self-esteem, negative affect, and performance composite scores at Time 1 were entered as covariates. To test Hypothesis 4a, self-esteem was entered into the model as the lone mediator variable. Results failed to find support for Hypothesis 4a (B = -0.01, SE = 0.02, 95%CI = [-0.06, 0.94]). To test Hypothesis 4b, negative affect was entered into the model as the lone mediator variable. Results failed to find support for Hypothesis 4b (B = -0.04, SE = 0.08, 95%CI = [-0.18, 0.13]). When both negative affect and self-esteem were entered as mediators simultaneously, the total indirect effect (B = -0.03, SE = 0.09, 95%CI = [-0.19, 0.16]) and the indirect effects of negative affect (B = 0.03, SE = 0.09, 95%CI = [-0.19, 0.18]) and self-esteem (B = -0.01, SE = 0.03, 95%CI = [-0.09, 0.06]) were all non-significant (ps > .05). Full results from the simultaneous mediation analysis are presented in Table 7.

Hypothesis 5-6 were examined by creating a 2 (constructive and destructive NPF) by 2 (mindfulness and mind wandering induction) by 2 (pre and post NPF manipulation) MANOVA using NPF as an independent variable, self-esteem and negative affect at Time 1 and Time 2 as

the within-person change variables, and mindfulness as the moderating variable. Mauchly's Test of Sphericity for this MANOVA indicated that the within-subjects effects of measure (W = 1.00, p>.05), time (W = 1.00, p>.05), and measure by time (W = 1.00, p>.05) did not violate the assumption of sphericity. Results from the repeated measures MANOVA failed to find support for a time*feedback*mindfulness effect on negative affect and self-esteem (F (1,160) = 0.15, p = .71; see Table 8 for full results of the MANOVA).

Hypothesis 5 stated that mindfulness would moderate the relationship between NPF and change in state self-esteem, such that there would be less of a decrease in state self-esteem for those in the mindfulness condition than for those in the control condition. Results from the follow-up univariate test did not find a significant time*feedback*mindfulness interaction on self-esteem (F (1,160) = 0.31, p = .58), indicating that, relative to the mindfulness condition, self-esteem did not decrease at a greater rate for the control condition (Table 9). Hypothesis 6 stated that mindfulness would moderate the relationship between NPF and change in state negative affect such that there would be less of an increase in state negative affect for those in the mindfulness condition than for those in the control condition. Results from the follow up univariate test did not find significant time*feedback*mindfulness interaction on negative affect (F (1,160) = 0.20, p = .65), indicating that, relative to the mindfulness condition, negative affect did not increase at a greater rate for the control condition (Table 10).

Hypotheses 7a and 7b stated that mindfulness would moderate the indirect effect of NPF on task performance through increases in negative affect and decreases in self-esteem, such that the negative indirect effects will be weaker for the mindfulness condition than the control condition. To build the full moderated-mediation model, NPF was entered as the independent variable, self-esteem and negative affect composite scores at Time 2 were entered as the

mediator variables, performance composite scores at Time 2 were entered as the dependent variable, and mindfulness was entered as the moderator variable. Self-esteem, negative affect, and performance composite scores at Time 1 were entered as covariates. To test Hypothesis 7a, self-esteem was included as the lone mediator variable in the model. Results from the moderated-mediation analyses did not find support for the interaction of mindfulness and NPF on task performance through self-esteem (B = 0.01, SE = 0.05, 95%CI = [-0.12, 0.12]. The indirect effects were insignificant at both the mindfulness (B = 0.01, SE = 0.03, 95%CI = [-0.08, 0.07]) and control (B = -0.01, SE = 0.04, 95%CI = [-0.08, 0.08]) level of the moderator. Results from the moderated-mediation analyses also did not find support for the interaction of mindfulness and NPF on task performance through negative affect when negative affect was included in the model as the lone mediator variable (B = 0.01, SE = 0.05, 95%CI = [-0.08, 0.16]. The indirect effects were insignificant for both the mindfulness (B = -0.03, SE = 0.07, 95% CI = [-0.17, 0.11]) and control (B = -0.04, SE = 0.09, 95%CI = [-0.23, 0.13]) level of the moderator. When self-esteem and negative affect are included as mediator variables simultaneously, nonsignificant moderated mediation effects were found through self-esteem (B = 0.02, SE = 0.06, 95%CI = [-0.14, 0.14]) and negative affect (B = 0.01, SE = 0.06, 95%CI = [-0.11, 0.15]), respectively. Thus, the results from Hypotheses 7a and 7b suggest that mindfulness did not moderate the effects of NPF on task performance through negative affect nor self-esteem. Full results from the moderated mediation model are presented in Table 11.

Exploratory Analyses

Further exploratory analyses were conducted to investigate whether negative affect and self-esteem mediate the effects of NPF on the very hard items of the RAT. The very hard items of the RAT should have required the most cognitive effort, and the combined strain experienced

through the theorized mediators might explain why performance on these items would decrease slightly from pre-NPF (M = 0.74, SD = 0.94) to post-NPF (M = 0.61, SD =1.04). To test this exploratory analysis, a mediation model was built using the Hayes PROCESS macro in SPSS. NPF was entered as the independent variable, self-esteem and negative affect composite scores at Time 2 was entered as the mediator variables, and performance composite scores of the very hard RAT items at Time 2 was entered as the dependent variable. Self-esteem, negative affect and very hard performance composite scores at Time 1 were entered as covariates. Results from this exploratory mediation model were not significant (B = 0.02, SE = 0.06, 95%CI = [-0.10, 0.14]) when the mediators were entered into the model simultaneously, as well as when self-esteem (B = 0.01, SE = 0.02, 95%CI = [-0.02, 0.06]) and negative affect (B = 0.03, SE = 0.05, 95%CI = [-0.08, 0.13]) were entered into the model separately, indicating that negative affect and self-esteem did not mediate the relationship between NPF and very hard items on the RAT.

Given that performance on average for the RAT increased following the delivery of NPF, I further explored whether mindfulness had an unexpected enhancing effect on performance. A growing body of literature has supported a positive relationship between mindfulness and creativity (Baas et al., 2014; Capurso et al., 2014; Lebuda et al., 2016), although no research to my knowledge has examined this relationship following an adverse event such as NPF. This exploratory hypothesis was examined by creating a 2 (constructive and destructive NPF) by 2 (mindfulness and mind wandering induction) by 2 (pre and post NPF manipulation) ANOVA model using NPF as an independent variable, task performance at Time 1 and Time 2 as the dependent variable, and mindfulness as the moderating variable. Results from the repeated measures ANOVA revealed that mindfulness did not have a significant main effect (F (1,160) =

0.28, $p = .60$) nor time*feedback*mindfulness effect (F (1,160) = 1.84, $p = .18$) on task performance.

Table 2. *Descriptive Statistics of Study Variables for Full Study Sample*

Variable	*M*	*SD*	Median	Min	Max	Skew	Kurtosis
Negative Affect at Time 1	1.38	0.46	1.20	1.00	3.6	2.17	5.80
Negative Affect at Time 2	1.35	0.43	1.20	1.00	3.2	1.77	3.53
Self-Esteem at Time 1	3.91	0.62	4.00	2.00	5.0	-0.49	0.03
Self-Esteem at Time 2	3.30	0.93	3.40	1.00	5.0	-0.16	-0.75
Task Performance at Time 1	2.57	1.96	2.00	0.00	10.0	0.90	0.76
Task Performance at Time 2	3.36	2.16	3.00	0.00	13.0	1.14	2.94
Physiological Awareness	3.19	0.87	3.33	1.00	5.00	-0.41	-0.19
Present Moment Focus	3.53	0.83	3.67	1.00	5.00	-0.42	0.08
Feedback Manipulation Check	6.41	1.07	7.00	1.00	7.0	-2.53	7.64
Previous Mindfulness Practice	2.10	1.04	2.00	1.00	5.00	1.14	2.94

Table 3. *Descriptive Statistics of Study Variables Across Feedback and Mindfulness Conditions*

	Constructive NPF		Destructive NPF		Mindfulness		Mind-Wandering	
Variable	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Negative Affect (Time 1)	1.35	0.43	1.40	0.49	1.34	0.42	1.41	0.50
Negative Affect (Time 2)	1.25	0.28	1.45	0.52	1.33	0.42	1.37	0.44
Self Esteem (Time 1)	3.93	0.62	3.88	0.63	3.94	0.62	3.87	0.63
Self Esteem (Time 2)	3.35	0.88	3.26	0.98	3.34	0.95	3.26	0.91
Task Performance (Time 1)	2.58	1.97	2.57	1.96	2.57	2.07	2.57	1.87
Task Performance (Time 2)	3.54	1.80	3.18	2.47	3.45	2.24	3.27	2.10
Physiological Awareness	3.12	0.86	3.26	0.89	3.37	0.78	3.01	0.93
Present Moment Focus	3.53	0.85	3.54	0.81	3.66	0.77	3.41	0.87
Feedback Manipulation Check	6.77	0.73	6.07	1.22	6.60	0.79	6.22	1.26
Sample Size	81	81	83	83	82	82	82	82

Table 4. *Descriptive statistics for study variables by each study condition*

	Constructive NPF and Mindfulness Induction		Constructive NPF and Control Induction		Destructive NPF and Mindfulness Induction		Destructive NPF and Control Induction	
Variable	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Negative Affect (Time 1)	1.32	0.33	1.38	0.52	1.37	0.50	1.44	0.49
Negative Affect (Time 2)	1.25	0.27	1.25	0.30	1.42	0.53	1.49	0.52
Self Esteem (Time 1)	3.94	0.67	3.93	0.58	3.95	0.58	3.82	0.52
Self Esteem (Time 2)	3.32	0.99	3.37	0.77	3.37	0.93	3.15	1.02
Task Performance (Time 1)	2.49	2.11	2.67	1.85	2.66	2.04	2.48	1.90
Task Performance (Time 2)	3.32	1.88	3.78	1.70	3.59	2.57	2.79	2.33
Physiological Awareness	3.29	0.73	2.93	0.95	3.44	0.84	3.08	0.90
Present Moment Focus	3.77	0.77	3.28	0.87	3.54	0.77	3.53	0.85
Feedback Manipulation Check	6.88	0.24	6.66	1.00	6.33	1.02	5.81	1.35
Sample Size	41	41	40	40	41	41	42	42

Table 5. *Intercorrelations of study variables*

Variable	1	2	3	4	5	6	7	8	9	10	11
1. Negative Affect at Time 1	-										
2. Negative Affect at Time 2	0.56**										
3. Self-Esteem at Time 1	-0.26**	-0.20*									
4. Self-Esteem at Time 2	0.04	-0.32**	0.44**								
5. Performance at Time 1	-0.10	-0.16*	-0.02*	0.10							
6. Performance at Time 2	0.06	-0.01	0.04	0.06	0.49**						
7. Physiological Awareness	0.16*	-0.02	0.07	0.18*	0.03	-0.01					
8. Present Moment Focus	-0.09	-0.14	0.27**	0.10	-0.06	-0.09	0.34**				
9. Feedback Manipulation Check	-0.12	-0.23**	0.11	0.09	0.01	0.09	0.16	0.07			
10. Previous Mindfulness Practice	0.02	-0.03	0.09	0.22*	-0.01	0.05	0.09	0.09	0.07		
11. Feedback Condition	-0.06	-0.24**	0.04	0.05	0.00	0.08	-0.08	-0.01	0.33**	0.01	
12. Mindfulness Condition	-0.07	-0.05	0.06	0.05	0.00	0.04	0.21**	0.15	0.18*	-0.07	0.01

Notes: *$p < .05$. **$p < .01$. Feedback Condition: 1 = Constructive NPF and 0 = Destructive NPF. Mindfulness Condition: 1 = Mindfulness and 0 = Control.

Table 6. *Repeated measures MANOVA results testing the effects of negative performance feedback on self-esteem, negative affect, and task performance*

Effect	Hypothesis df	Error df	*F*	Pillai's Trace	Wilks' Lambda	Hotelling's Trace	Roy's Largest Root	Corrected df	Corrected *F*
Measure	2	161	582.77**	0.88	0.12	7.24	7.24	1.32	172.69**
Measure X NPF	2	161	1.44	0.18	0.98	0.02	0.02	1.32	0.83
Time	1	162	0.87	0.01	1.00	0.01	0.01	1.00	0.87
Time X NPF	1	162	0.49	0.00	1.00	0.00	0.00	1.00	0.49
Measure X Time	2	161	36.45**	0.31	0.69	0.45	0.45	1.37	42.74**
Measure X Time X NPF	2	161	1.54	0.02	0.98	0.02	0.02	1.37	1.37

Note: Corrected values reflect Greenhouse-Geisser corrections for sphericity of within-subjects effects. Measure refers to self-esteem, negative affect, and task performance. NPF refers to negative performance feedback. *$p < .05$. **$p < .01$.

Table 7. *Bootstrapped mediation test of negative performance feedback predicting task performance at Time 2, controlling for self-esteem, negative affect, and task performance at Time 1*

Indirect Effect	*B*	*SE*	*95%LLCI*	*95%ULCI*
Total	-0.03	0.09	-0.19	0.16
Self-Esteem	0.03	0.09	-0.19	0.18
Negative Affect	-0.01	0.03	-0.09	0.06

Note. n = 164. Bootstrap sample size = 5,000. LL = lower limit; CI = confidence interval; UL = upper limit.

Table 8. *Repeated measures MANOVA results testing mindfulness as a moderator on the relationship between NPF, self-esteem, and negative affect*

Effect	Hypothesis df	Error df	*F*	Pillai's Trace	Wilks' Lambda	Hotelling's Trace	Roy's Largest Root
Measure	1	160	1154.60**	0.88	0.12	7.22	7.22
Measure X NPF	1	160	2.22	0.01	1.00	0.01	0.01
Measure X Mindfulness	1	160	0.97	0.01	1.00	0.01	0.01
Measure X NPF X Mindfulness	1	160	0.72	0.01	1.00	0.01	0.01
Time	1	160	110.42**	0.41	0.59	0.69	0.69
Time X NPF	1	160	0.87	0.01	1.00	0.01	0.01
Time X Mindfulness	1	160	0.12	0.00	0.00	0.00	0.00
Time X NPF X Mindfulness	1	160	0.15	0.00	1.00	0.00	0.00
Measure X Time	1	160	43.64**	0.21	0.79	0.27	0.27
Measure X Time X NPF	1	160	1.11	0.01	0.99	0.01	0.01
Measure X Time X Mindfulness	1	160	0.01	0.00	1.00	0.00	0.00
Measure X Time X NPF X Mindfulness	1	160	0.35	0.00	1.00	0.00	0.00

Note: Measure refers to self-esteem and negative affect. NPF refers to negative performance feedback. *$p < .05$. **$p < .01$.

Table 9. *Repeated measures ANOVA results testing mindfulness as a moderator on the relationship between NPF and self-esteem*

Effect	Hypothesis df	Error df	*F*	Pillai's Trace	Wilks' Lambda	Hotelling's Trace	Roy's Largest Root
Measure	1	160	79.66**	0.33	0.67	0.50	0.50
Measure X NPF	1	160	0.07	0.00	1.00	0.00	0.00
Measure X Mindfulness	1	160	0.01	0.00	1.00	0.00	0.00
Measure X NPF X Mindfulness	1	160	0.31	0.00	1.00	0.00	0.00

Note: Measure refers to self-esteem. NPF refers to negative performance feedback. *$p < .05$. **$p < .01$.

Table 10. *Repeated measures ANOVA results testing mindfulness as a moderator on the relationship between NPF and negative affect*

Effect	Hypothesis df	Error df	*F*	Pillai's Trace	Wilks' Lambda	Hotelling's Trace	Roy's Largest Root
Measure	1	160	0.65	0.00	1.00	0.00	0.00
Measure X NPF	1	160	5.26*	0.32	0.97	0.03	0.03
Measure X Mindfulness	1	160	0.22	0.00	1.00	0.00	0.00
Measure X NPF X Mindfulness	1	160	0.20	0.00	1.00	0.00	0.00

Note: Measure refers to negative affect. NPF refers to negative performance feedback. *$p < .05$. **$p < .01$.

Table 11. *Moderated mediation test of negative performance feedback predicting task performance at Time 2, controlling for self-esteem, negative affect, and task performance at Time 1*

Bootstrapped Indirect Effect at Different Levels of Moderator				
Variable			*Bootstrap CI*	
	Effect	*Boot SE*	*LL 95% CI*	*UL 95% CI*
Self-Esteem (mindfulness)	0.01	0.03	-0.08	0.07
Self-Esteem (control)	-0.01	0.04	-0.08	0.08
Negative Affect (mindfulness)	-0.03	0.07	-0.17	0.11
Negative Affect (control)	-0.04	0.09	-0.23	0.13

	Bootstrap Results for Index of Moderated Mediation		*Bootstrap CI*	
	Index	*Boot SE*	*LL 95% CI*	*UL 95% CI*
Self-Esteem	0.02	0.06	-0.14	0.14
Negative Affect	0.01	0.06	-0.11	0.15

Note. n = 164. Bootstrap sample size = 5,000. LL = lower limit; CI = confidence interval; UL = upper limit. Condition: 1 = Mindfulness and 0 = Control; 1 = Constructive NPF and 0 = Destructive NPF. R^2 = .26, $F(6, 157) = 9.41$, $p < .001$

CHAPTER FOUR:

DISCUSSION

Overall, results from the analyses failed to find support for the hypothesized relationships. Results showed that neither decreases in self-esteem nor increases in negative affect were greater following destructive NPF compared to when constructive NPF was provided. Contrary to predictions, task performance increased following both forms of NPF. Further, results did not show support for the hypothesized mediation between NPF, changes in self-esteem and negative affect, and changes in task performance. The mindfulness induction failed to moderate the relationship between NPF and self-esteem as well as negative affect. Finally, mindfulness did not significantly moderate the relationships between NPF and self-esteem and negative affect, as well as the proposed mediated relationships.

Reviewing the results from the analyses is helpful for drawing conclusions as well as proposing alternative explanations. To begin, I hypothesized that there would be significantly greater decreases in self-esteem and increases in negative affect when destructive NPF was provided than when constructive NPF was provided. The null results from the current study are inconsistent with previous empirical research investigating these relationships (Baron, 1988) as well as leading feedback theoretical models (Kluger & DeNisi, 1996). Although the scripts from the feedback manipulations were based upon previous research that successfully elicited cognitive and affective strain from the destructive NPF condition relative to the constructive NPF condition (Baron, 1988), the delivery of the NPF manipulation in the current study was

conducted via video chat as opposed to in an in-person laboratory environment. Perhaps a virtual delivery is perceived as less threatening to participants than an in-person delivery and requires a stronger manipulation to elicit the intended effect.

I also hypothesized that task performance would decrease more so for the destructive NPF condition than for the constructive NPF condition. Contrary to this hypothesis, results from the study found that there were significant increases in task performance following both NPF manipulations. Although these results are unexpected, the feedback literature does provide clues as to relevant mediator variables that may explain the current study's findings. For example, previous research found an association between perceived accuracy of NPF and increases in performance (Gray, 2006; Kinicki et al., 2004). Scholars suggest that accurate perceptions of NPF triggers a feeling of needing to respond, and that those who feel like their performance warranted NPF may be more likely to increase effort and focus (Gray, 2006; Kinicki et al., 2004). Perhaps participants were already expecting NPF given the low scores on the RAT task (M = 2.57 at Time 1 out of a total possible score of 15), and were primarily concerned with improving performance on the second performance trial rather than reflecting on what the NPF represented about themselves.

I hypothesized that changes in negative affect and self-esteem would mediate the relationship between NPF and task performance. These hypothesized relationships were also not supported. It may be the case that these null findings were due to insufficient strain induced by the NPF manipulations. As discussed before, the results from the hypothesis testing did not find a significant time by feedback effect on self-esteem and negative affect. Because the NPF manipulation did not provide much cognitive and affective strain, the current study's results are consistent with feedback intervention theory such that there were no negative downstream effects

on task performance. Exploratory analyses also indicated that changes in self-esteem and negative affect were not enough to significantly mediate the relationship between NPF and the most cognitively demanding items from the RAT. Again, a stronger NPF manipulation may be needed for reexamining the hypothesized mediation relationships.

I also hypothesized that mindfulness would act as a moderator on the relationships between NPF, self-esteem, and negative affect, as well as moderate the proposed mediation relationships. These hypotheses were also not supported. These findings are in contrast with previous research that found brief mindfulness inductions to be an effective regulatory technique for buffering the effects of threatening and emotional events (Leyland et al., 2019; Weger et al., 2012). The discrepancy between previous research and the current study's findings may be a result of participants not experiencing enough strain for the mindfulness induction to make a meaningful regulatory impact. Mindfulness scholars suggest that mindfulness may produce greater beneficial effects among those who are experiencing high amounts of strain (Creswell & Lindsay, 2014).

Theoretical and Practical Applications

The results from the current study offer contributions to both the feedback and mindfulness literatures as well as relevant information for practitioners. First, this study contributes to the feedback literature through the use of novel methodology (virtually delivered NPF). Millions of workers have begun working remotely amidst the current global pandemic (Koetsier, 2020). The feedback literature, however, provides little research investigating the effects of NPF when it is delivered virtually. There is an opportunity for further research to investigate whether leading theories on feedback, such as FIT, hold when NPF is delivered virtually, or if there are certain aspects of virtual feedback that elicit different reactions within

the recipient. FIT currently proposes that the method of delivery matters for influencing how individuals respond to NPF; when NPF is delivered by a computer, individuals are more likely to direct their attention to the task, whereas when NPF is delivered by a human, individuals are more likely to direct their attention to the self (Kluger & DeNisi, 1996). However, further research is needed to fully understand whether NPF delivered by humans virtually elicits different responses than when humans deliver NPF in a face-to-face setting. The current study hopes to act as a springboard for other feedback research using virtual methodology.

This study also adds to the feedback literature through posing future research questions. Primarily, is the relevance of the task important for predicting reactions to NPF? Although the current study was informed by FIT to include the necessary feedback cues (person delivered verbal NPF, discouraging and self-esteem threatening NPF) and task characteristics (resource intensive task) for eliciting psychological reactions that would negatively impact performance, the study's results failed to support the predicted effects. Although the study may have inadequately provided the proper conditions for testing the hypotheses, it is also possible that the theoretical models used in the study are not entirely correct. Many participants explained during the study debrief that they were not particularly impacted by the NPF because they believed their creative performance did not hold much relevance to their career path. It may be the case that task relevance is an important antecedent variable that amplifies or mitigates reactions to the pertinent feedback cues detailed in FIT. Although the feedback literature has uncovered salient situational variables and task characteristics that can influence reactions to NPF, theoretical models may consider including contextual variables such as task relevance or meaningfulness.

The results of this research also contribute to the mindfulness literature. Mindfulness and self-regulation theory suggest that the regulatory effects of mindfulness may be beneficial during

adverse work events (Glomb et al., 2011). This study tested the regulatory effects of mindfulness during a particular adverse work event - negative performance feedback. The results from this study add to mindful self-regulation theory by suggesting possible boundary effects, such that mindfulness may not produce particularly helpful regulatory effects to employees when they are experiencing low levels of strain following NPF.

From a practical perspective, this study found that delivering NPF virtually can be effective at eliciting improvements in performance. Practitioners may want to take the study's results with caution until future research adds to our understanding on how and when virtual NPF can produce intended and unintended performance consequences. Currently, the feedback literature has a scarcity of information related to the outcomes of virtual NPF.

Limitations

This study contained several limitations that may have contributed to the null results. Thus, the findings from this study should be interpreted with caution. One meaningful limitation from this study is that the destructive NPF manipulation may not have had as strong of an impact as needed to fully investigate the hypothesized relationships. One interesting consideration is that although the results of the NPF manipulation check suggested a successful manipulation, the mean score of the NPF measure for the destructive NPF condition was very high, indicating that most participants in the destructive NPF condition still found the experimenter to be predominantly gentle, caring, sensitive, and respectful when delivering feedback. Perhaps the impact of destructive NPF is softened when delivered virtually, or I was simply not 'destructive' enough when delivering the destructive NPF.

Second, this study was not conducted in a controlled lab environment, thereby introducing a plethora of confounding variables. It may be the case that one's environment where they participated in the study (the vast majority participated from their home) induced a comforting effect on participants that enhanced one's ability to recover following the NPF manipulation. Furthermore, external noise from one's environment (e.g., roommate cooking in the kitchen or landscapers mowing the lawn) may have shortened or mitigated one's state of mindfulness following the mindful induction.

Finally, this study relied on self-report measures for collecting data on self-esteem, negative affect, and the NPF and mindfulness manipulation checks. This study may have benefitted from more ecologically valid data such as behavioral measurements of the study's variables.

Future Directions

The current study investigated how individuals respond to two different types of NPF and introduced mindfulness as a self-regulatory technique that could provide beneficial effects on affective, cognitive, and performance outcomes. Although the study's results did not support the hypotheses, future research may continue to expand upon this work while addressing the previously discussed limitations.

To begin, future research is needed to explain why participants in the current study did not experience significant levels of strain when destructive NPF was delivered compared to when constructive NPF was delivered. There are multiple explanations for the null effects. On the one hand, I may not have delivered the destructive NPF manipulation forcefully enough. On the other hand, there may be mediator variables at play that may explain why individuals

experience less strain when receiving NPF virtually compared to when they receive NPF in person. Future qualitative research may want to compare employees' experiences when they receive NPF virtually versus when they receive NPF in person to help identify potential mediator variables. Furthermore, because of the mass transition towards remote work, the feedback literature is in need of a virtual NPF manipulation that reliably elicits levels of strain comparable to when NPF is delivered in person so as to help understand whether current theories of NPF hold when NPF is delivered remotely.

Second, future research may want to use a different performance task to help understand if the current study's findings generalize to broader work scenarios. Feedback from participants in the present study indicated that creative performance is not central to their identity nor is it relevant to their future careers. In lieu of this, participants may have been less reactive when they received NPF because performing well on the RAT was not important to them. Future research using performance tasks that involve problem solving or decision making is encouraged as performance on these tasks may be more central to one's identity as well as relevant to the workplace.

Finally, future research should reexamine mindfulness as a potential moderator on the relationship between NPF and self-esteem and negative affect when the NPF manipulation produces the expected time by condition effect on the dependent variables. Because of the methodological limitations, results from the current study are insufficient for drawing conclusions on the efficacy of mindfulness as a regulatory technique for NPF. Because mindfulness is theorized to have greater beneficial effects when one is experiencing higher levels of strain (Creswell & Lindsay, 2014), future mindfulness and NPF research would be worth conducting when using a stronger NPF manipulation.

Conclusion

The aim of this project was to examine whether mindfulness buffers the negative reactions of NPF. The NPF manipulation failed to induce time by condition effects on self-esteem, negative affect, and task performance. Further, the findings from the study did not show a significant buffering effect of mindfulness on the study's dependent variables. Future research investigating the potential regulatory benefits of mindfulness on the cognitive and affective effects from NPF while addressing the previously discussed limitations is encouraged.

REFERENCES

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

Audia, P. G., & Locke, E. A. (2003). Benefiting from negative feedback. *Human Resource Management Review*, *13*(4), 631–646. https://doi.org/10.1016/j.hrmr.2003.11.006

Baas, M., Nevicka, B., & Ten Velden, F. S. (2014). Specific mindfulness skills differentially predict creative performance. *Personality and Social Psychology Bulletin*, *40*(9), 1092–1106. https://doi.org/10.1177/0146167214535813

Bargh, J. (1994). The four horsemen of automaticity: Awareness, intention, efficiency, and control in social cognition. In *Handbook of social cognition* (2nd ed., pp. 3–40). Psychology Press.

Baron, R. A. (1988). Negative effects of destructive criticism: Impact on conflict, self-efficacy, and task performance. *Journal of Applied Psychology*, *73*(2), 199–208.

Baron, R. A. (1990). Countering the effects of destructive criticism: The relative efficacy of four interventions. *Journal of Applied Psychology*, *75*(3), 235–247.

Beal, D. J., Weiss, H. M., Barros, E., & MacDermid, S. M. (2005). An episodic process model of affective influences on performance. *Journal of Applied Psychology*, *90*(6), 1054–1068. https://doi.org/10.1037/0021-9010.90.6.1054

Belschak, F. D., & Den Hartog, D. N. (2009). Consequences of positive and negative feedback: The impact on emotions and extra-role behaviors. *Applied Psychology*, *58*(2), 274–303. https://doi.org/10.1111/j.1464-0597.2008.00336.x

Bowden, E. M., & Jung-Beeman, M. (2003). Normative data for 144 compound remote associate problems. *Behavior Research Methods, Instruments, & Computers*, *35*(4), 634–639. https://doi.org/10.3758/BF03195543

Britt, T. W., McKibben, E. S., Greene-Shortridge, T. M., Beeco, A., Bodine, A., Calcaterra, J., Evers, T., McNab, J., & West, A. (2010). Self-engagement as a predictor of performance and emotional reactions to performance outcomes. *British Journal of Social Psychology*, *49*(2), 237–257. https://doi.org/10.1348/014466609X438090

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

Brown, K. W., Ryan, R. M., & Creswell, J. D. (2007). Mindfulness: Theoretical foundations and evidence for its salutary effects. *Psychological Inquiry*, *18*(4), 211–237. https://doi.org/10.1080/10478400701598298

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

Brunot, S., Huguet, P., & Monteil, J.-M. (2000). Performance feedback and self-focused attention in the classroom: When past and present interact. *Social Psychology of Education*, *3*, 277–293.

Buckingham, M., & Goodall, A. (2019, March 1). The Feedback Fallacy. *Harvard Business Review*. https://hbr.org/2019/03/the-feedback-fallacy

Capurso, V., Fabbro, F., & Crescentini, C. (2014). Mindful creativity: The influence of mindfulness meditation on creative thinking. *Frontiers in Psychology*, *4*. https://doi.org/10.3389/fpsyg.2013.01020

Carver, C. S., & Scheier, M. F. (1981). The self-attention-induced feedback loop and social facilitation. *Journal of Experimental Social Psychology*, *17*(6), 545–568. https://doi.org/10.1016/0022-1031(81)90039-1

Chaiken, S. (1980). Heuristic versus systematic information processing and the use of source versus message cues in persuasion. *Journal of Personality and Social Psychology*, *39*(5), 752–766.

Chory, R. M., & Kingsley Westerman, C. Y. (2009). Feedback and fairness: The relationship between negative performance feedback and organizational justice. *Western Journal of Communication*, *73*(2), 157–181. https://doi.org/10.1080/10570310902856055

Creswell, J. D., & Lindsay, E. K. (2014). How does mindfulness training affect health? A mindfulness stress buffering account. *Current Directions in Psychological Science*, *23*(6), 401–407. https://doi.org/10.1177/0963721414547415

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

DeNisi, A., & Kluger, A. (2000). Feedback effectiveness: Can 360-degree appraisals be improved? *Academy of Management Executive*, *14*(1), 129–139.

DeSteno, D., Lim, D., Duong, F., & Condon, P. (2018). Meditation inhibits aggressive responses to provocations. *Mindfulness*, *9*(4), 1117–1122. https://doi.org/10.1007/s12671-017-0847-2

Eddy, M. D., Brunyé, T. T., Tower-Richardi, S., Mahoney, C. R., & Taylor, H. A. (2015). The effect of a brief mindfulness induction on processing of emotional images: An ERP study. *Frontiers in Psychology*, *6*(1391), 1-12. https://doi.org/10.3389/fpsyg.2015.01391

Eskreis-Winkler, L., & Fishbach, A. (2019). Not learning from failure—The greatest failure of all. *Psychological Science*, *30*(12), 1733–1744. https://doi.org/10.1177/0956797619881133

Faul, F., Erdfelder, E., Buchner, A., & Lang, A.-G. (2009). Statistical power analyses using G*Power 3.1: Tests for correlation and regression analyses. *Behavior Research Methods*, *41*(4), 1149–1160. https://doi.org/10.3758/BRM.41.4.1149

Gaddis, B., Connelly, S., & Mumford, M. D. (2004). Failure feedback as an affective event: Influences of leader affect on subordinate attitudes and performance. *The Leadership Quarterly*, *15*(5), 663–686. https://doi.org/10.1016/j.leaqua.2004.05.011

Glomb, T. (2002). Workplace anger and aggression: Informing conceptual models with data from specific encounters. *Journal of Occupational Health Psychology*, *7*(1), 20–36.

Glomb, T. M., Duffy, M. K., Bono, J. E., & Yang, T. (2011). Mindfulness at work. In A. Joshi, H. Liao, & J. J. Martocchio (Eds.), *Research in Personnel and Human Resources Management* (Vol. 30, pp. 115–157). Emerald Group Publishing Limited. https://doi.org/10.1108/S0742-7301(2011)0000030005

Good, D. J., Lyddy, C. J., Glomb, T. M., Bono, J. E., Brown, K. W., Duffy, M. K., Baer, R. A., Brewer, J. A., & Lazar, S. W. (2016). Contemplating mindfulness at work: An integrative

review. *Journal of Management*, *42*(1), 114–142. https://doi.org/10.1177/0149206315617003

Gray, A. A. (2006). An investigation of the effects of perceived feedback accuracy on performance. *University of South Florida Scholar Commons*, 1–99.

Grenny, J. (2019, June 17). How to Be Resilient in the Face of Harsh Criticism. *Harvard Business Review*. https://hbr.org/2019/06/how-to-be-resilient-in-the-face-of-harsh-criticism

Hafenbrack, A. C., & Vohs, K. D. (2018). Mindfulness meditation impairs task motivation but not performance. *Organizational Behavior and Human Decision Processes*, *147*, 1–15. https://doi.org/10.1016/j.obhdp.2018.05.001

Harris, M. J., & Rosenthal, R. (1985). Mediation of interpersonal expectancy effects: 31 Meta-Analyses. *Psychological Bulletin*, *97*(3), 363–386.

Hayes, A. F. (2017). *Introduction to mediation, moderation, and conditional process analysis, Second Edition: A regression-based approach*. Guilford Publications.

Heatherton, T. E., & Polivy, J. (1991). Development and validation of a scale for measuring state self-esteem. *Journal of Personality and Social Psychology*, *60*(6), 895–910.

Heppner, W. L., Kernis, M. H., Lakey, C. E., Campbell, W. K., Goldman, B. M., Davis, P. J., & Cascio, E. V. (2008). Mindfulness as a means of reducing aggressive behavior: Dispositional and situational evidence. *Aggressive Behavior*, *34*(5), 486–496. https://doi.org/10.1002/ab.20258

Higgins, T. (1987). Self-discrepancy: A theory relating self and affect. *Psychological Review*, *94*(3), 319–341.

Hülsheger, U. R., Alberts, H. J. E. M., Feinholdt, A., & Lang, J. W. B. (2013). Benefits of mindfulness at work: The role of mindfulness in emotion regulation, emotional exhaustion, and job satisfaction. *Journal of Applied Psychology*, *98*(2), 310–325. https://doi.org/10.1037/a0031313

IBM Corp. (2017). *IBM SPSS Statistics for Windows* (25.0) [Computer software]. IBM Corp.

Ilgen, D., & Davis, C. (2000). Bearing bad news: Reactions to negative performance feedback. *Applied Psychology*, *49*(3), 550–565. https://doi.org/10.1111/1464-0597.00031

Ilgen, D. R., Fisher, C. D., & Taylor, M. S. (1979). Consequences of individual feedback on behavior in organizations. *Journal of Applied Psychology*, *64*(4), 349–371. https://doi.org/10.1037/0021-9010.64.4.349

Ilgen, D. R., Mitchell, T. R., & Frederickson, J. W. (1981). Poor performers: Supervisors' and subordinates' responses. *Technical Report*, *517*, 1–23.

Ilies, R., De Pater, I. E., & Judge, T. (2007). Differential affective reactions to negative and positive feedback, and the role of self-esteem. *Journal of Managerial Psychology*, *22*(6), 590–609. https://doi.org/10.1108/02683940710778459

Kabat-Zinn, J. (2006). Mindfulness-based interventions in context: Past, present, and future. *Clinical Psychology: Science and Practice*, *10*(2), 144–156. https://doi.org/10.1093/clipsy.bpg016

Kanfer, R., & Ackerman, P. L. (1989). Motivation and cognitive abilities: An integrative/aptitude-treatment interaction approach to skill acquisition. *Journal of Applied Psychology*, *74*(4), 657–690. https://doi.org/10.1037/0021-9010.74.4.657

Keng, S.-L., Robins, C. J., Smoski, M. J., Dagenbach, J., & Leary, M. R. (2013). Reappraisal and mindfulness: A comparison of subjective effects and cognitive costs. *Behaviour Research and Therapy*, *51*(12), 899–904. https://doi.org/10.1016/j.brat.2013.10.006

Kinicki, A. J., Prussia, G. E., Wu, B. (Joshua), & McKee-Ryan, F. M. (2004). A covariance structure analysis of employees' response to performance feedback. *Journal of Applied Psychology*, *89*(6), 1057–1069. https://doi.org/10.1037/0021-9010.89.6.1057

Kluger, A. N., & DeNisi, A. (1996). The effects of feedback interventions on performance: A historical review, a meta-analysis, and a preliminary feedback intervention theory. *Psychological Bulletin*, *119*(2), 254–284. https://doi.org/10.1037/0033-2909.119.2.254

Koetsier, J. (2020). *58% Of American Knowledge Workers Are Now Working Remotely*. Forbes. https://www.forbes.com/sites/johnkoetsier/2020/03/20/58-of-american-knowledge-workers-are-now-working-remotely/

Koy, A., & Yeo, G. (2008). BIS sensitivity, negative affect and performance: Dynamic and multilevel relationships. *Human Performance*, *21*(2), 198–225. https://doi.org/10.1080/08959280801917826

Lam, C. F., DeRue, D. S., Karam, E. P., & Hollenbeck, J. R. (2011). The impact of feedback frequency on learning and task performance: Challenging the "more is better" assumption. *Organizational Behavior and Human Decision Processes*, *116*(2), 217–228. https://doi.org/10.1016/j.obhdp.2011.05.002

Latham, G. P., & Locke, E. A. (1991). A theory of goal setting and task performance. *The Academy of Management Review*, *16*(2), 212–247. https://doi.org/10.2307/258875

Lau, M. A., Bishop, S. R., Segal, Z. V., Buis, T., Anderson, N. D., Carlson, L., Shapiro, S., Carmody, J., Abbey, S., & Devins, G. (2006). The toronto mindfulness scale:

Development and validation. *Journal of Clinical Psychology*, *62*(12), 1445–1467. https://doi.org/10.1002/jclp.20326

Leary, M., & Diebels, K. (2017). The hypo-egoic impact of mindfulness on self, identity, and the processing of self-relevant information. In *Mindfulness in social psychology* (pp. 50–64).

Lebuda, I., Zabelina, D. L., & Karwowski, M. (2016). Mind full of ideas: A meta-analysis of the mindfulness–creativity link. *Personality and Individual Differences*, *93*, 22–26. https://doi.org/10.1016/j.paid.2015.09.040

Leyland, A., Rowse, G., & Emerson, L.-M. (2019). Experimental effects of mindfulness inductions on self-regulation: Systematic review and meta-analysis. *Emotion*, *19*(1), 108–122. https://doi.org/10.1037/emo0000425

Liang, L. H., Brown, D. J., Ferris, D. L., Hanig, S., Lian, H., & Keeping, L. M. (2018). The dimensions and mechanisms of mindfulness in regulating aggressive behaviors. *Journal of Applied Psychology*, *103*(3), 281–299. https://doi.org/10.1037/apl0000283

Long, E. C., & Christian, M. S. (2015). Mindfulness buffers retaliatory responses to injustice: A regulatory approach. *Journal of Applied Psychology*, *100*(5), 1409–1422. https://doi.org/10.1037/apl0000019

Lorenzet, S. J., Salas, E., & Tannenbaum, S. I. (2005). Benefiting from mistakes: The impact of guided errors on learning, performance, and self-efficacy. *Human Resource Development Quarterly*, *16*(3), 301–322. https://doi.org/10.1002/hrdq.1141

McFarlin, D. B., & Blascovich, J. (1984). On the remote associates test (RAT) as an alternative to illusory performance feedback: A methodological note. *Basic and Applied Social Psychology*, *5*(3), 223–229. https://doi.org/10.1207/s15324834basp0503_5

Mednick, S. (1962). The associative basis of the creative process. *Psychological Review*, *69*(3), 220–232. https://doi.org/10.1037/h0048850

Neuman, J. H., & Baron, R. A. (1998). Workplace violence and workplace aggression: Evidence concerning specific forms, potential causes, and preferred targets. *Journal of Management*, *24*(3), 391–419. https://doi.org/10.1177/014920639802400305

Norman, D., & Bobrow, D. (1975). On data-limited and resource-limited processes. *Cognitive Psychology*, *7*(1), 44–64. https://doi.org/10.1016/0010-0285(75)90004-3

O'Malley, A. L., & Gregory, J. B. (2011). Don't be such a downer: Using positive psychology to enhance the value of negative feedback. *The Psychologist-Manager Journal*, *14*(4), 247–264. https://doi.org/10.1080/10887156.2011.621776

Ortner, C., & Zelazo, P. (2014). Responsiveness to a mindfulness manipulation predicts affect regarding an anger-provoking situation. *Canadian Journal of Behavioural Science*, *46*(2), 117–124.

Porter, J. (2019, January 8). How leaders can get honest, productive feedback. *Harvard Business Review*. https://hbr.org/2019/01/how-leaders-can-get-honest-productive-feedback

R Core Team. (2019). *R: A language and environment for statistical computing.* R Foundation for Statistical Computing.

Ramachandran, S., & Flint, J. (2018, October 25). At Netflix, radical transparency and blunt firings unsettle the ranks. *Wall Street Journal*. https://www.wsj.com/articles/at-netflix-radical-transparency-and-blunt-firings-unsettle-the-ranks-1540497174

Raver, J. L., Jensen, J. M., Lee, J., & O'Reilly, J. (2012). Destructive criticism revisited: appraisals, task outcomes, and the moderating role of competitiveness. *Applied Psychology*, *61*(2), 177–203. https://doi.org/10.1111/j.1464-0597.2011.00462.x

Revelle, W. (2020). *psych: Procedures for psychological, psychometric, and personality research* (2.0.9) [Computer software]. Northwestern University. https://CRAN.R-project.org/package=psych

Ruttan, R. L., & Nordgren, L. F. (2016). The strength to face the facts: Self-regulation defends against defensive information processing. *Organizational Behavior and Human Decision Processes*, *137*, 86–98. https://doi.org/10.1016/j.obhdp.2016.06.006

SIOP. (2019, January 9). *It's the same, only different: New trends join returning topics in SIOP's 6th annual top 10 workplace trends*. http://www.siop.org/Research-Publications/Items-of-Interest/ArtMID/19366/ArticleID/1639/It%C3%A2%C2%80%C2%99s-the-Same-Only-Different

Smith, C., & Kirby, L. (2001). Affect and cognitive appraisal processes. In *Handbook of Affect and Social Cognition* (pp. 75–92). Erlbaum.

Smith, C., & Lazarus, R. (1991). Emotion and adaption. In *Handbook of Personality: Theory and Research* (pp. 609–637).

Thorndike, E. (1913). *The psychology of learning*. The Mason-Henry Press. https://books.google.com/books?hl=en&lr=&id=zLkBAAAAYAAJ&oi=fnd&pg=PA1&dq=thorndike+1913+law+of+effect&ots=UTq6L4lXRx&sig=e9Qre3OlfbBf-VsIfgq61PwoxuM#v=onepage&q=law%20of%20effect&f=false

Vancouver, J. B., & Tischner, E. C. (2004). The effect of feedback sign on task performance depends on self-concept discrepancies. *Journal of Applied Psychology*, *89*(6), 1092–1098. https://doi.org/10.1037/0021-9010.89.6.1092

Watson, D., Anna, L., & Tellegen, A. (1988). *Development and validation of brief measures of positive and negative affect: The PANAS Scales*. *Journal of Personality and Social Psychology*, *54*(6), 1063–1070.

Weger, U. W., Hooper, N., Meier, B. P., & Hopthrow, T. (2012). Mindful maths: Reducing the impact of stereotype threat through a mindfulness exercise. *Consciousness and Cognition*, *21*(1), 471–475. https://doi.org/10.1016/j.concog.2011.10.011

Wenk-Sormaz, H. (2005). Meditation can reduce habitual responding. *Alternative Therapies*, *11*(2), 42–60.

Zimmerman, R. D., & Darnold, T. C. (2009). The impact of job performance on employee turnover intentions and the voluntary turnover process: A meta-analysis and path model. *Personnel Review*, *38*(2), 142–158. https://doi.org/10.1108/00483480910931316

APPENDICES

Appendix A: Items used for the Remote Associates Test (Bowden & Jung-Beeman, 2003)

Trial	Item	Answer	Level	Trial	Item	Answer	Level
1	home/sea/bed	sick	very hard	2	manners/round/tennis	table	medium
1	flower/friend/scout	girl	medium	2	mate/shoes/total	running	very hard
1	stick/maker/point	match	hard	2	playing/credit/report	card	medium
1	dust/cereal/fish	bowl	hard	2	chamber/mask/natural	gas	hard
1	notch/flight/spin	top	medium	2	age/mile/sand	stone	hard
1	mail/board/lung	black	very hard	2	forward/flush/razor	straight	very hard
1	wise/work/tower	clock	very hard	2	wagon/break/radio	station	medium
1	cry/front/ship	battle	very hard	2	way/ground/weather	fair	very hard
1	line/fruit/drunk	punch	very hard	2	quick/spoon/screen	silver	medium
1	cross/rain/tie	bow	hard	2	room/blood/salts	bath	medium
1	blank/list/mate	check	medium	2	over/plant/horse	power	very hard
1	pie/luck/belly	pot	medium	2	sore/shoulder/sweat	cold	very hard
1	fox/man/peep	hole	medium	2	computer/cable/broadcast	network	very hard
1	lounge/hour/napkin	cocktail	very hard	2	jury/door/side	panel	very hard
1	artist/hatch/route	escape	very hard	2	tank/hill/secret	top	hard

Appendix B: State Negative Affect Scale (Watson, Clark, & Tellegen, 1988)

Thinking about yourself and how you feel at this moment, to what extent do you feel:

	Very slightly or not at all (1)	A little (2)	Moderately (3)	Quite a bit (4)	Always (5)
Distressed (1)	○	○	○	○	○
Upset (2)	○	○	○	○	○
Guilty (3)	○	○	○	○	○
Scared (4)	○	○	○	○	○
Hostile (5)	○	○	○	○	○
Irritable (6)	○	○	○	○	○
Ashamed (7)	○	○	○	○	○
Nervous (8)	○	○	○	○	○
Jittery (9)	○	○	○	○	○
Afraid (10)	○	○	○	○	○

Appendix C: State Self-Esteem Performance Subscale (Heatherton & Polivy, 1991)

Answer these questions as they are true for you RIGHT NOW.

[Additional note: Items labeled with an 'R' indicate reverse scored items]

	Not at all (1)	A little bit (2)	Somewhat (3)	Very much (4)	Extremely (5)
I feel confident about my abilities. (1)	○	○	○	○	○
I feel as smart as others. (2)	○	○	○	○	○
I feel confident that I understand things. (3)	○	○	○	○	○
I feel that I have less scholastic ability right now than others.R (4)	○	○	○	○	○
I feel like I'm not doing well.R (5)	○	○	○	○	○

Appendix D: Demographics

What is your gender?

- ○ Male (1)
- ○ Female (2)
- ○ Gender variant/Nonconforming (3)
- ○ Not listed (4) _____

What is your age in years?

_____

What is your ethnicity?

- ○ African-American, Black, or Afro-Caribbean (1)
- ○ Asian/Pacific Islander (2)
- ○ White or Caucasian (3)
- ○ Hispanic or Latino (4)
- ○ Other (please specify) (5) _____

How often do you practice mindfulness meditation?

- ○ Never (not once) (1)
- ○ Rarely (a few times a year or less) (2)
- ○ Sometimes (about once a month) (3)
- ○ Frequently (about once a week) (4)
- ○ Always (about once a day) (5)

Appendix E: Cover Story

"The task you will be performing is a creative performance task. This task has been validated and used by companies to predict creative performance. You should do your best to perform well on this task because your performance will be an indication of your creative abilities in the workplace. You will perform the task once, then listen to 8 minutes of an audio-guided relaxation tape, then you will perform the task again. Please take these study activities seriously."

Appendix F: Task Performance Instructions

"You will be given a set of three words and it is your job to come up with one word that can be associated in a meaningful way with all three words. Before we do the first official performance trial, we will do three practice rounds to ensure that you understand how the performance task works.

For the first practice round, the three words I will provide for you are cottage, swiss, and cake. What is one word that associates in a meaningful way with each of the three words? (give the participant time to think and make a guess). The correct word is cheese – cottage cheese, swiss cheese, and cheesecake. For the second practice round the words are cream, skate, and water (give the participant time to think and make a guess). The correct word is ice – ice cream, ice skate, and ice water. The words for the last practice round are sleeping, bean, and trash (give the participant time to think and make a guess). The correct word is bag – sleeping bag, bean bag, and trash bag."

Appendix G: Debrief Script

"The purpose of this study is to examine the effects of negative performance feedback on psychological processes and performance outcomes, and how relaxation techniques can influence these effects. The primary objective of this study is to see how much your experiences changed before and after receiving fake negative performance feedback and listening to an 8-minute relaxation tape. The performance feedback that I delivered to you is not how you actually performed, it was a script that I was trained to recite. I do not actually know how you performed in relation to other people that completed this task. Furthermore, your performance on this task is not a reflection of your abilities.

How do you feel about this study and participating in it? Are you okay with the deception that happened?

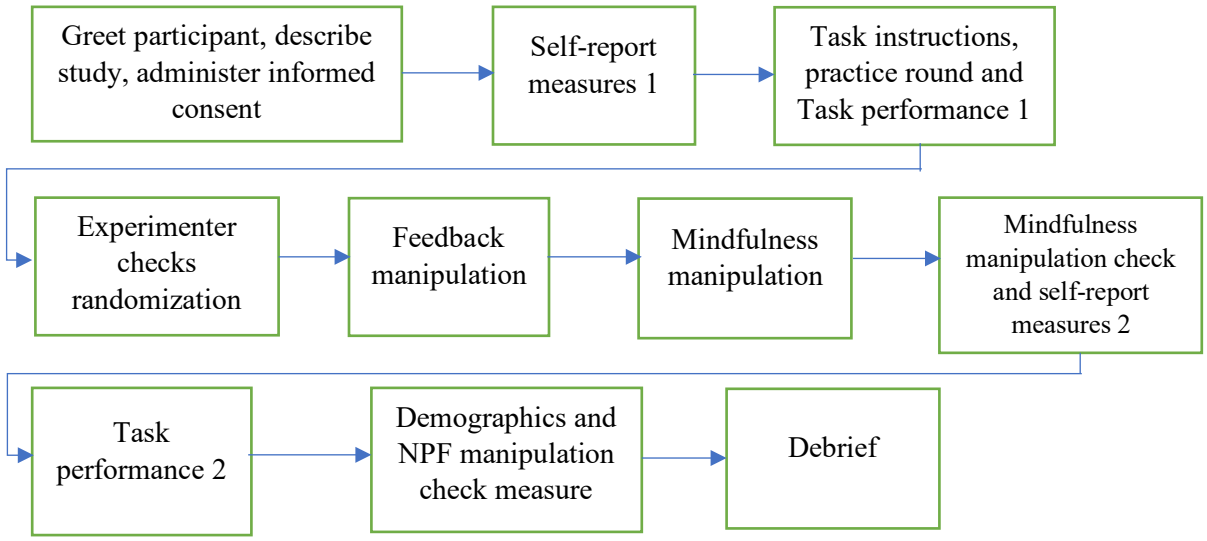
Should you feel uncomfortable or upset with the deception, you may choose to have your data removed from the study. Would you like your data to be removed from the study?

In order to maintain the effectiveness of these manipulations, I request that you do not share your experiences from this study with others. Prior knowledge of this experiment can jeopardize the effectiveness of the manipulations and compromise the integrity of the study's results. You can share information that was presented in the informed consent document, but please do not share other information such as the hypotheses that were discussed.

Thank you again for participating in this experiment today. If you have any questions or would like more specific information about this study, please refer to the informed consent form for my contact information. Your SONA points will be awarded to you within the next 24 hours."

Appendix H: Procedural Figure

Figure A1. Order of procedural events.



Appendix I: IRB Approval Letter

APPROVAL

March 31, 2020

Jeremiah Slutsky

Dear Jeremiah Slutsky:

On 3/30/2020, the IRB reviewed and approved the following protocol:

Application Type:	Initial Study
IRB ID:	STUDY000595
Review Type:	Expedited 7
Title:	Performance and Relaxation Study
Funding:	None
IND, IDE, or HDE:	None
Approved Protocol and Consent:	• Performance and Relaxation Study Protocol • Performance and Relaxation Study Informed Consent Attached are stamped approved consent documents. Use copies of these documents to document consent.

Within 30 days of the anniversary date of study approval, confirm your research is ongoing by clicking Confirm Ongoing Research in BullsIRB, or if your research is complete, submit a study closure request in BullsIRB by clicking Create Modification/CR.

In conducting this protocol you are required to follow the requirements listed in the INVESTIGATOR MANUAL (HRP-103).

Your study qualifies for a waiver of the requirements for the documentation of informed consent for the online study procedures as outlined in the federal regulations at 45 CFR 46.117(c).

UNIVERSITY OF SOUTH FLORIDA

Sincerely,

Amanda Shelley
IRB Research Compliance Administrator