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Effects of a Brief Mindfulness Induction on Death-Related Anxiety

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EFFECTS OF A BRIEF MINDFULNESS INDUCTION
ON DEATH-RELATED ANXIETY

by

David Matthew Schultz

A Thesis
Submitted to the Graduate School
and the Department of Psychology
at The University of Southern Mississippi
in Partial Fulfillment of the Requirements
for the Degree of Master of Arts

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ABSTRACT

EFFECTS OF A BRIEF MINDFULNESS INDUCTION

ON DEATH-RELATED ANXIETY

by David Matthew Schultz

May 2016

Terror management theory postulates that the behavior and beliefs of individuals are influenced on some level by an underlying aversion to death. Mortality salience, the conscious awareness of one's own impending death, creates behavioral changes in individuals compared to non-mortality salient individuals. These changes in behavior are referred to as distal and proximal defense mechanisms. Relatively little research has investigated mechanisms to buffer effects of mortality salience. Mindfulness refers to a conscious awareness and acceptance of moment-to-moment experiences. By allowing individuals to take a regulated view of difficult situations, mindfulness may attenuate the negative effects of mortality salience. The present study included three conditions: Mindfulness, Mind-Wandering, and Worrying. Individuals in the Mindfulness condition underwent a brief mindfulness induction at the experiment's outset, while participants in the other two conditions did nothing or underwent a worry induction. All conditions underwent a mortality salience induction immediately after experimental manipulation. A series of measures were used to measure negative affect, distal and proximal defense responses, and trait mindfulness. Statistical analysis revealed significant reduction in the Mindfulness and Mind-Wandering groups, compared with the Worrying group. Negative affect was lower in the Mindfulness group than in the Worrying group after the mortality salience induction. No change in distal defense mechanisms was found. Trait mindfulness

correlated with negative affect at multiple time points as well as with proximal defense mechanisms. Results of the present study suggest that brief mindfulness exercises are effective in buffering against negative affect and some defensive responses to mortality salience.

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CHAPTER I – BACKGROUND

Terror Management Theory

Terror Management Theory (TMT) postulates that the condition of existential anxiety as resulting from knowledge of one's inevitable death is unique to humans (Greenberg, Pyszczynski, & Solomon, 1986). More importantly, TMT posits that the behavioral effects of mortality salience apply across multiple domains, including psychopathology, legal decision making, sexuality, and religious behavior (Kesebir, 2014, p. 611). In TMT terminology, the conscious awareness of one's impending death is referred to as mortality salience. Mortality salience is a central concept in TMT, and cognitive and behavioral reactions to it can vary widely, with many individuals reporting extreme anxiety and distress when confronted with the thought of their own death (Kesebir, 2014). An extensive body of empirical evidence supports the hypothesis that mortality salience has some negative effects on behavior such as increased aggression and hostility toward individuals with opposing worldviews or cultural values (Florian & Mikulincer, 1997) and increased favoritism toward individuals with whom one shares a similar worldview (Greenberg, Simon, Pyszczynski, Solomon, & Chatel, 1992; Niemiec et al., 2010).

Although the existence of these emotional and behavioral phenomena in response to mortality salience has been well documented, relatively little research has investigated ways to buffer against the negative emotional and behavioral effects of mortality salience. These phenomena may be especially distressing to vulnerable populations who may consistently have death-related thoughts—for example, suicidal or depressed individuals, individuals with chronic or terminal illness, or those nearing the end of the

natural lifespan. As such, the psychological literature would benefit from experimental research specifically investigating means of buffering against the negative aspects of mortality salience as a means of decreasing negative emotionality in vulnerable populations and improving overall quality of life.

At the individual level, TMT posits that the extent to which a given individual possesses a feeling of personal value plays a pivotal role in determining how that individual responds to mortality salience. In fact, TMT states that self-esteem in humankind serves essentially as a means of protecting oneself from the unpleasant idea that the individual's life is essentially worthless, among other existential concerns arising from contemplation of one's mortality (Burke, Martens, & Faucher, 2010). By investing oneself with a sense of value that transcends the existence of a physical body, the individual is able to create a sense of purpose and meaning for their lives (Simon, Arndt, Greenberg, Pyszczynski, & Solomon, 1998). Often, this sense of value is fostered by involving oneself with a broader social entity—for example, involvement in social, political, or religious movements that provide assurance that the individual is part of something that will outlive them. Whatever mechanism the individual uses, the fundamental goal is to achieve a symbolic immortality by living life in such a way that the individual's actions have continued effects long after their physical death. In doing so, the individual overcomes the fear of total annihilation at the point of death and attenuates the anxiety-inducing effects of mortality salience.

In TMT literature, this sense of personal value is referred to as self-esteem. Under TMT, self-esteem is comprised of possessing a firmly held belief in two factors: Firstly, that one possesses a worldview that is superior to all opposing worldviews, or is at least

valid and internally consistent to the individual; and second, that one meets the standards of behavior espoused by that worldview (Florian & Mikulincer, 1997). For most individuals, this worldview is provided by the culture with which the individual chooses to identify. According to TMT, culture is able to deflect this anxiety by providing a set of behavioral standards that both provide self-esteem and promise symbolic permanence to those who fulfill these standards (Greenberg et al., 1992, p. 212).

These cultural worldviews can come in a variety of forms, including religious devotion, political activism, or dedication to an idealistic cause. A wealth of other strategies by which the individual can overcome the anxiety resulting from mortality salience have been proposed throughout history by philosophers and theologians, both ancient and modern, but the broad conceptualization regarding the both fundamental causes and common ‘solutions’ to this quandary offered by TMT tends to hold fast when subjected to scientific inquiry.

One of the most common means of examining the effect of mortality salience in the context of TMT is by observing the effect of experimental manipulations of mortality salience on cognitions and behavior (Niemic et al., 2010). Of particular interest to researchers are what are referred to as proximal and distal defense mechanisms exhibited in subjects who are prompted to be consciously aware of their own mortality. Proximal defense mechanisms typically refer to conscious attempts to suppress or ignore mortality-related thoughts, while distal defense mechanisms are conceptualized as alterations in behavior which are relatively indirect or unconscious in nature. The tendency for mortality salient individuals to hand out harsher punishments to hypothetical criminals, for example, is considered a proximal defense mechanism.

It has been established that increased mortality salience can arouse distress, anxiety, and sadness (Burke et al., 2010; Florian & Mikulincer, 1997; Greenberg et al., 1992; Kesebir, 2014). Psychological defense responses to these difficult and painful feelings have been well-documented in the literature. A meta-analysis by Burke et al. (2010) found that, on average, across 277 experiments, mortality salience yielded moderate effects ($r = .35$) on various indices of defensive responses. For example, individuals who have undergone a mortality salience induction are more likely to defend their sociocultural beliefs and values. Such individuals also show increased aggression toward others who violate their worldview, more negative responses to those who violate their moral beliefs (Florian & Mikulincer, 1997), and a higher likelihood of bias and favoritism toward those who support their worldview, compared to those who have not undergone mortality salience induction (Greenberg et al., 1992; Niemic et al., 2010). Individuals who are made consciously aware of their mortality are also more likely to strive to meet cultural standards of value. In studies conducted in Western cultures, where physical activity and attractiveness are highly prized, such individuals show greater preference for activities involving positive body image than those who have not undergone such an induction (Niemic et al., 2010). All these reactions to mortality salience, from the perspective of TMT, are considered to function as defenses against the uncomfortable emotions elicited by mortality salience.

Proximal and distal defense responses can be measured in a variety of ways. Proximal defense mechanisms typically refer to active suppression of death or mortality-related thoughts. Previous research has examined proximal defense responses in the contexts of suppression of death thoughts, denial of vulnerability to terminal disease or

premature death (Niemiec et al., 2010), as well as positive cognitive and behavioral changes such as increased intention to exercise (Arndt, Schimel & Goldenberg, 2003) and use sunscreen (Routledge, Arndt, & Goldenberg, 2004). These latter two results suggest that defensive responses to mortality salience are not necessarily negative but rather may serve important survival functions from the vantage point of evolutionary psychology.

Distal defense mechanisms are conceptualized to be defense mechanisms which are more unconscious or symbolic in nature than proximal defense responses. Distal defense responses are more closely related to threats to self-esteem or worldview than to explicit death-related thoughts. According to TMT, individuals under mortality salience should defend personal beliefs by denigrating those who oppose their cultural values or opinions (Niemiec et al., 2010, p. 345). Empirical data support this hypothesis, in that subjects who have undergone mortality salience inductions respond more negatively to those who oppose their worldview or violate their sense of morality than subjects who have not undergone such an induction (Florian & Mikulincer, 1997).

The mechanism by which defensive responses occur in response to mortality salience is rooted in the activation of cognitive schemata. Although most measures of defensive mechanisms are ambiguous tasks that do not directly measure the latent constructs of proximal and distal defense mechanisms, they serve as effective proxy measures of both constructs. Theoretically, certain cognitive schemata will be temporarily activated, contingent on which experimental condition each individual is assigned to. Activation of these schemata leads to varied responses consistent with the experimental condition. Summaries, reviews, and meta-analyses of TMT literature (Burke et al., 2010; Greenberg, Solomon, & Pyszczynski, 1997) provide evidence for this

hypothesis. For instance, similar distal responses appear in participants across studies even when different methods of inducing mortality salience are used. Likewise, participants tend to respond differently to death versus non-death related primes, indicating a modification in cognitive state when death-related priming is introduced to the participants' schema. Therefore, although the end result is the same, it can be argued that measures of defensive mechanisms are better described as measures detecting cognitive schema activation as the result of a defensive response toward death-related thoughts, rather than direct measures of defensive reactivity itself.

To summarize, individuals feel anxiety and distress when experiencing mortality salience (Burke et al., 2010; Florian & Mikulincer, 1997; Greenberg et al., 1992; Kesebir, 2014). Although it is impossible to prevent the physical occurrence of death, individuals can cultivate a sense of symbolic immortality by connecting themselves to a collective purpose that endures beyond the individual's lifespan (Greenberg et al., 1992)—in other words, the individual adopts a worldview that provides a sense of purpose and meaning. Whether religious, idealistic, or political in nature, these collective worldviews involve a set of unambiguous standards of behavior and belief (e.g., ideas of right and wrong) that are valued by both the individual and the culture with which they identify (Florian & Mikulincer, 1997). By forthrightly adhering to these standards—that is, by adhering to one's cultural worldview—the individual accomplishes goals and achievements which he or she believes will have positive lasting effects extending beyond one's own physical lifespan. In so doing, the individual feels a sense of permanence, marked by the idea that one's own actions will have a meaningful, lasting impact on the world long after physical death. This sense of permanence is referred to as symbolic immortality and assuages the

existential anxiety created by awareness that physical death is close at hand (Greenberg et al., 1992).

Mindfulness and Acceptance

Interest in mindfulness as both a psychological construct and means of regulating emotion has drastically expanded in the last few decades (Brown, Ryan, & Creswell, 2007), particularly in clinical psychology and related fields. Mindfulness and mindfulness-based interventions have shown efficacy in a vast number of contexts, including stress reduction (Grossman, Niemann, Schmidt, & Walach, 2004) as well as the treatment of depression, anxiety, sexual disorders, eating disorders, drug dependence, ADHD, and chronic pain (Chambers, Gullone, & Allen, 2009).

Despite the recent explosion of mindfulness-oriented research, mindfulness itself remains an elusive concept. Currently, there is no universally agreed upon definition of what it is or how to measure it. According to Chambers et al. (2009), “It remains unclear whether mindfulness represents a distinct construct or a quality of consciousness that spans and incorporates other states.” Black (2009) postulates that attempts to operationalize the word “mindfulness” have yielded to at least three different, but related, domains: trait mindfulness, the individual’s ability to easily adopt mindful states and attitudes; state mindfulness, the state of present-moment awareness achieved by mindfulness practices; and the literal behavioral practice of mindfulness itself (e.g., practicing mindfulness meditation).

Indeed, as is the case with many psychological constructs, it is difficult to come to a consensus definition of mindfulness. Among leading researchers and mindfulness practitioners, however, some broad, general definitions have emerged which do seem to

point in the right direction. A three-point definition offered by Kabat-Zinn (1994) defines mindfulness as “paying attention in a particular way: on purpose in the present moment, and nonjudgmentally.” The three components of mindfulness postulated in Kabat-Zinn’s definition—purposefulness, focus on the present moment, and a nonjudgmental attitude—appear as common threads throughout most definitions of mindfulness.

It is agreed upon that mindfulness involves a vivid, conscious sense of awareness of one’s immediate surroundings, sensations, and feelings (Brown & Ryan, 2003). Emphasis is placed on seeing the world and one’s own internal experiences “as they are,” refraining from judgment or appraisal, positive, negative, or otherwise, as one attempts to objectively and consciously experience the immediate moment.

Traditionally, mindfulness practices have encouraged a nonjudgmental and accepting attitude toward unpleasant aspects of the human experience as they are felt from moment to moment as a part of the “bare” awareness that makes up mindfulness (Brown et al., 2007). Rather than rejecting any analysis of thoughts or experiences as they are experienced, however, mindful thought instead alters one’s cognitive relation to their own thoughts. Mindful individuals possess the skill of viewing thoughts in the same way that one may view other sensory phenomena—for example, sights, sounds, and scents. In doing so, mindful individuals are able to view their own thoughts, be they unpleasant or otherwise, as simply thoughts, and are thus able to emotionally respond to them in a more objective and less threatened manner (Brown et al., 2007). In other words, mindfulness allows the individual to process difficult thoughts and feelings in a more objective and regulated manner. By viewing difficult feelings through the lens of mindfulness, individuals are better equipped to analyze difficult thoughts and feelings

without the emotional charge that accompanies prejudice, fear, discrimination, personal beliefs, or other sources of bias.

A second aspect of mindfulness, closely connected to the “bare” attention to sensory input, thoughts, and feelings, which necessarily constitutes the core of mindful thinking, is a sense of flexibility toward awareness and attention. Individuals who are practiced in mindful thinking tend to possess a greater control over the focus of their attention, allowing them to focus in on particular aspects of reality or “zoom out” to view the broader context in which phenomena exist (Brown et al., 2007). This skill, when practiced, leads to increased psychological flexibility, which is associated with the ability to adapt to varying situations, adapt cognitions to fit social contexts or needs, view one’s own behaviors objectively, and compare one’s own behaviors to one’s values (Kashdan & Rottenberg, 2010).

Some research suggests that mindfulness can be briefly heightened in laboratory settings. A study by Arch and Craske (2006) successfully heightened mindfulness in undergraduate subjects who underwent a ten-minute mindfulness induction, compared to subjects who did not. Individuals who underwent the induction went on to show heightened emotional regulation and distress tolerance when exposed to extremely unpleasant visual stimuli later in the experiment. Although popular opinion states that mindfulness is a skill that is best trained over a longer period of time, this study indicates that a mindful state can be briefly induced in the laboratory even with individuals that are new to mindfulness practice.

A series of nine studies by Gailliot, Schmeichel, and Baumeister (2006) established that emotional self-regulation moderates the degree to which individuals

experience death-related anxiety in response to a mortality salience induction. They found that participants high in self-control experienced fewer death-related thoughts under mortality salience, less anxiety, and less worldview defense under mortality salience. Although this study investigated self-regulation as a means of attenuating death anxiety, mindfulness was not specifically examined. It stands to reason, however, that mindfulness may be an effective tool in attenuating defensiveness toward thoughts of mortality because of its inherent means of increasing psychological flexibility and emotional self-regulation.

Although the presence of defensive responses in response to mortality salience has been well established (Kesebir, 2014; Niemiec et al., 2010, Sliter, Sinclair, Yuan, & Mohr, 2014), very few studies have examined the impact of mindfulness on these responses. To date, only one series of published studies directly examined mindfulness and mortality salience (Kesebir, 2014). This series of studies (Niemiec et al., 2010; Sliter, et al., 2014) examined the topic from the perspective of trait mindfulness. These studies found that the degree of defensive responses after a mortality salience induction was negatively correlated with trait mindfulness. No study has attempted to measure the effect an experimental manipulation of mindfulness may have on responses to mortality salience, although previous studies have demonstrated that mindfulness can be briefly heightened in a laboratory setting (Arch & Craske, 2006). This raises the question of whether a laboratory-induced increase in state mindfulness will moderate defensive responses to mortality salience. The present study attempted to address this question with an experimental design.

Proposed Study and Hypotheses

If mindfulness is associated with greater psychological flexibility, emotional regulation, and distress tolerance, it stands to reason that a mindful and accepting attitude toward death-related cognitions may assuage anxiety, fear, or other negative affect associated with mortality salience. By altering one's cognitive attitude toward death through mindfulness, one may experience lessened distress when confronted with thoughts of death.

As a consequence of this lessened negative affect when presented with mortality salience, one may come to the logical conclusion that this effect of increased mindfulness will in turn be associated with decreased defensive responses to mortality salience. In other words, individuals in a mindful state would, when confronted with the prospect of death in a lab setting, exhibit fewer proximal and distal defensive responses towards thoughts of death than individuals who were in a less mindful state.

The purpose of the study was to examine whether those who undergo the mindfulness induction prior to the mortality salience induction would show (A) fewer proximal defensive responses, (B) fewer distal defense responses, and (C) will report lower levels of negative affect during and after exposure to a mortality salience stimulus, compared to individuals who did not undergo the mindfulness condition.

CHAPTER II – METHOD

Participants

A total of 77 participants completed the experiment. Participants were undergraduate students at the University of Southern Mississippi, recruited through an online subject pool, and received course credit for participation. Potentially eligible students were screened through online survey software and, if eligible, scheduled a time to complete the study in the laboratory setting.

The final sample was 80.5% female and 40.3% White, 54.5% Black/African-American, 1.3% Asian/Asian-American, and 3.9% multi-racial. Approximately 62.4% of the participants were in their first or second year of college. Participant ages ranged from 18 to 46, with a mean age of 20.7 ($SD = 4.80$).

To be eligible for participation in the study, participants were required to be 18 years or older, may not have been treated or used psychotropic medication for mental disorders in the last two years, and must have had no previous experience in mindfulness or meditation techniques. These eligibility criteria were adapted from Arch & Craske (2006) who induced mindfulness in inexperienced participants in a laboratory setting.

Materials

Word Fragment Task

In order to operationalize proximal defense mechanisms, participants completed a set of 25 word fragments (Greenberg, Pyszczynski, Solomon, Simon, & Breus, 1994; Arndt, Greenberg, Pyszczynski, & Solomon, 1997) containing a blank space into which letters could be written. Eight of these word fragments could be filled with either a death-related word or a neutral word (e.g., KI__ED can be completed neutrally [KISSED,

KICKED], or with a death-related word [KILLED]). The fragments which could not be filled with death-related words served as filler items to prevent participants from guessing the purpose of the fragment task. This task, adapted from methods used by Niemiec et al. (2010), measured death-thought accessibility and was treated as a proxy for proximal defense responses. Proximal defense responses were scored by counting how many word fragments were completed with a death-related word. A higher number of completed death-related words indicated a greater defensive response in individuals who took the task after undergoing a mortality salience induction.

Multidimensional Social Transgression Scale

Distal defense mechanisms were operationalized using an adaptation of the Multidimensional Social Transgression Scale (MSTS) developed by Florian and Mikulincer (1997). The scale consists of 20 short vignettes written in the style of a newspaper report. Each vignette describes a major calamity befalling an undeserving victim due to the moral or social transgression of another. Each vignette describes either intrapersonal or interpersonal consequences for the victim. Interpersonal consequences involve extreme damage to one's social standing, family, and/or friends as a result of the offender's transgression (e.g., a man's social reputation is ruined after falsely testing positive for HIV under the care of an incompetent doctor). Conversely, intrapersonal consequences involve direct damage to the victim, typically in the form of physical or mental harm (e.g., a doctor mixes up the records of two patients and amputates the leg of the wrong one). The original MSTS was written for use in Israel, with many of the original vignettes referring specifically to Israeli culture. For example, one vignette refers to a "kibbutz" with the implicit assumption that the participant will know what the word

means. For the present study, all culturally-specific vignettes were removed, reducing the number of vignettes to ten. This also mimicked the MSTS as it was used by Niemec et al. (2010).

After reading a given vignette, the participant was instructed to rate the severity of the transgression on a 7-point scale. The participant was also instructed to rate the severity of punishment appropriate for the perpetrator of each particular transgression, again on a 7-point scale. Distal defense response was scored by summing both “severity of transgression” and “severity of punishment” scores for all ten vignettes to create a single, composite score.

Positive Affect Negative Affect Schedule

. The PANAS (Watson, Clark, & Tellegen, 1988) was administered at multiple time points during the study to measure state negative affect. With a Cronbach’s alpha coefficient of .84 to .87 and test-retest correlations of 0.39 to 0.71 for the negative affect subscale (Watson et al., 1988), the PANAS demonstrates strong validity and reliability with regards to general positive and negative affect. Different instruction sets can be used to assess either state or trait affectivity. The instruction set asking participants to rate how they feel “right now” was used for the current study, which directed test-takers to rate emotions as they are experiencing them at that very moment.

Philadelphia Mindfulness Scale

Trait mindfulness was assessed using the Philadelphia Mindfulness Scale (PHLMS; Cardaciotto, Herbert, Forman, Moitra, & Farrow, 2008). The PHLMS is a bidimensional measure developed to assess two key components of mindfulness via two independent subscales: present-moment awareness and acceptance (Cardaciotto et al.,

2008). The scale consists of two ten-item subscales measuring awareness and acceptance, respectively. Each item is rated on a 5-point Likert-type scale (1 = never, 5 = very often) according to the frequency with which they experienced the described item over the past week (Cardaciotto et al., 2008). Both the awareness subscale and acceptance subscale demonstrated very good internal consistency in a sample of 204 nonclinical undergraduates, with Cronbach's alpha coefficient of .81 and .85 respectively. The scale has demonstrated convergent, discriminant, concurrent, and predictive validity across both clinical and normal undergraduate populations (Quaglia, Brown, Lindsay, Creswell, & Goodman, 2015). To obtain the score for each subscale, all appropriate items are totaled and reverse scored where indicated. Higher scores reflect higher levels of awareness and acceptance (Cardaciotto et al., 2008). Participants were given both the awareness and acceptance subscales of the PHLMS during the course of the study.

Kentucky Inventory of Mindfulness Scales

A second measure of trait mindfulness was used to accompany the PHLMS. The Kentucky Inventory of Mindfulness Scales (KIMS; Baer, Smith, & Allen, 2004) is a 39-item self-report measure in which each item is rated on a 5-point Likert-type scale (1 = never or very rarely true, 5 = almost always or always true) according to the extent to which the participant endorses a given trait. The scale has demonstrated high content validity as well as adequate to good internal consistency, with alpha coefficients ranging from .76 to .91 across four factors, measuring observation, describing, acting with awareness, and acting without judgment. To obtain a global score for the measure, all items are totaled and reverse scored as indicated, with higher scores indicating greater trait mindfulness.

Cognitive and Affective Mindfulness Scale—Revised

A third measure of trait mindfulness was used. The Cognitive and Affective Mindfulness Scale—Revised (CAMS-R; Feldman, Hayes, Kumar, Greeson, & Laurenceau, 2007) is a 12-item self-report measure in which each item is rated on a 4-point Likert-type scale (1 = rarely/not at all, 4 = almost always) according to how often a given item applies to the respondent. The measure has demonstrated an acceptable Cronbach's alpha of .74 to .77 and shows evidence of convergent and discriminant validity. To obtain a score, items are reverse scored as necessary and summed, with higher scores indicating higher trait mindfulness.

Procedure

The experiment was conducted in a research lab in the University of Southern Mississippi Psychology Department. Participants sat at a desk with a laptop computer which was used to fill out questionnaires and complete free writing portions of the experiment. All measures and stimuli were presented through a web-based survey system. The experimenter left the room during all inductions in order to limit distraction of the participants.

After providing informed consent, participants first completed the PANAS in order to establish an affect baseline across conditions, along with the PHLMS, KIMS, and CAMS-R. Afterward, participants were randomly assigned to one of three conditions: Mindfulness, Worrying, and Mind-Wandering. The Worrying condition was included in order to mimic ruminative and catastrophic thinking that may result from distressing thought, while the Mind-Wandering condition acted as a neutral condition in which the participant idly distracts themselves from perseverating on a given thought for

more than a minute or so at a time. In the Mindfulness condition, participants underwent a brief mindfulness induction by following recorded instructions. The recorded instructions were taken from a guided meditation used by neuroscientist Sam Harris (Harris, 2013). The meditation exercise directed the participant's attention to breathing and immediate bodily sensations, instructing the participant to simply maintain an awareness of their sensory experience rather than trying to control it (e.g., by controlling one's rate of inhalation/exhalation). This method is derived from Vipassana meditation and is designed specifically to cultivate mindful attention and awareness. In the Worrying condition, participants listened to a ten-minute audio recording in which they were instructed to imagine their current worries or concerns across a variety of domains (relationships, personal achievement, health, personal safety). Participants were instructed to imagine the outcome of the worst-case scenario that could possibly result from each of these concerns and consider the likelihood of each worry occurring in reality. This catastrophizing technique was adapted from methods used by Vasey & Borkovec (1992). In the Mind-Wandering condition, participants were instructed to allow their mind to wander aimlessly, with instructions to continue to allow their mind to wander repeated approximately once per minute. Each manipulation lasted approximately ten minutes and recorded instructions for all manipulations were presented via headphones. After the experimental manipulation, all participants were asked to rate how closely they attempted to follow the instructions presented by each manipulation on a seven point Likert scale.

Participants then underwent a mortality salience induction wherein they were instructed to write vividly about their own death (e.g., what they expect will happen to

them, how it will feel as they die) using the procedures described by Niemiec et al. (2010). Participants were asked to “Briefly describe the emotions that the thought of your own death arouses in you...Jot down, specifically as you can, what you think will happen to you as you die and once you are dead.” (Niemiec et al., 2010). Next, participants completed the PANAS a second time, followed by the MSTS and the word fragment task to assess distal and proximal defense responses. Participants then completed the PANAS a third time and were given the opportunity to ask questions about the study before leaving.

CHAPTER III – RESULTS

Statistical Analysis

Statistical analysis began with a series of correlations between trait mindfulness and the three dependent variables to assess for potential covariates to be used in subsequent analyses. Trait mindfulness scales which correlated with a dependent variable were entered as covariates in analyses utilizing that variable alone. A one-way MANCOVA was used to assess for effects of experimental condition on negative affect, while a series of follow-up ANCOVA's were used to examine each isolated time point identified as significant in the MANCOVA. An ANCOVA was used to assess for effects of condition on number of death-related words completed during the word fragment task. An ANOVA was used to measure effects of condition on responses to the MSTs.

Correlations of Trait Mindfulness with Dependent Variables

Correlations were used to examine the relation between trait mindfulness, as measured by the three trait mindfulness scales, and the three main dependent variables (negative affect at Time 1 and Time 2, number of death-related words written during the word fragment task, MSTs score). MSTs scores were computed for each of the following four domains: evaluations of (a) severity of personal offenses, (b) severity of punishment for personal offenses, (c) severity of interpersonal offenses, and (d) severity of punishment for interpersonal offenses. These correlations are presented in Table 1.

Table 1

Intercorrelations for Three Trait Mindfulness Measures and Seven Dependent Variables

Measure	PHLMS	KIMS	CAMS-R
1. Death-Related Words	-.139	-.348**	-.193
2. Interpersonal Offense Severity	.173	.215	.139
3. Interpersonal Punishment Severity	.087	.160	.009
4. Intrapersonal Offense Severity	.300*	.289*	.229
5. Intrapersonal Punishment Severity	.188	.230	.178
6. Negative Affect Time 2	-.111	-.040	-.351**
7. Negative Affect Time 3	-.101	-.060	-.331**

Note: * $p < .05$, ** $p < .01$

As seen in Table 1, a significant negative relation was found between the CAMS-R total score and negative affect at Time 2 (immediately after the mortality salience induction), $r(75) = -.351, p = .002$, and Time 3 (at the end of the study), $r(73) = -.331, p = .004$. A significant negative relation was also found between the KIMS and number of death-related words written during the word fragment task, $r(62) = -.348, p = .005$. A positive relation was found between perceived severity of personal offenses and both the KIMS, $r(59) = .289, p < .024$, and the PHMS, $r(68) = .300, p < .012$.

Because there was a significant negative relation between mindfulness (CAMS-R) and negative affect after the mortality salience induction as well as at the end of the experiment, CAMS-R scores were entered as a covariate in subsequent analyses when negative affect was the dependent variable.

Baseline Negative Affect

A one-way ANOVA was conducted to confirm that baseline negative affect was similar across all three experimental conditions. No significant main effect was present, $F(2, 73) = .787, p = .459$, indicating that all three experimental groups possessed equivalent levels of negative affect at the beginning of the experiment.

Participant Effort

A one-way ANOVA was conducted to assess for differences in across all three experimental conditions when participants were asked to rate how closely they attempted to follow the instructions presented in each experimental manipulation. No significant differences were found between the Mindfulness, ($M = 5.57, SD = 1.16$), Mind-Wandering ($M = 6.07, SD = .874$), and Worrying ($M = 5.69, SD = 1.09$) conditions, $F(2, 73) = 1.66, p = 1.99$, indicating that all three groups utilized approximately the same amount of effort in adhering to the presented instructions. This indicates that a moderately high level of effort was made by all three groups to adhere to the instructions presented in each experimental manipulation.

Effect of Experimental Condition on Negative Affect

A one-way MANCOVA was conducted to assess the effect of experimental condition (mindfulness, mind-wandering, worrying) on PANAS negative affect scores at Times Two and Three with trait mindfulness (CAMS-R) entered as a covariate. A significant multivariate effect was observed (Wilks' $\lambda = .857, F(4, 138) = 2.679, p = .030, \text{partial } \eta^2 = .074$). The results of the MANCOVA and follow-up ANCOVA's are presented in Tables 2 and 3

Table 2

Means and Standard Deviations for the Effects of Mindfulness, Mind-Wandering, and Worrying Conditions on Nine Dependent Variables

Variable	Mindfulness		Mind-Wandering		Worrying	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Negative Affect Time 1	14.00	5.28	16.11	7.65	13.96	4.97
Negative Affect Time 2	13.09	3.50	15.89	5.24	18.46	6.57
Negative Affect Time 3	12.36	3.19	13.96	5.42	14.92	4.73
Number of Death-Related Words	2.26	.99	2.26	1.29	2.95	.92
Interpersonal Transgression Severity	43.16	2.99	43.13	4.24	44.67	5.16
Interpersonal Transgression Punishment	42.63	3.61	42.88	4.64	43.25	5.33
Intrapersonal Transgression Severity	43.16	4.03	42.08	4.79	43.87	4.78
Intrapersonal Transgression Punishment	40.26	4.92	40.83	5.09	41.25	5.43

Table 3

Analyses of Variance for the Effects of Mindfulness, Mind-Wandering, and Worrying Conditions on Nine Dependent Variables

Variable	<i>F</i>	<i>p</i>	<i>Partial eta</i> ²
Negative Affect Time 1	.978	.38	.03
Negative Affect Time 2	5.83	.01	.14
Negative Affect Time 3	1.57	.22	.04
Number of Death-Related Words	4.61	.01	.14
Interpersonal Transgression Severity	.97	.38	.03
Interpersonal Transgression Punishment	.10	.91	.00
Intrapersonal Transgression Severity	.93	.40	.03
Intrapersonal Transgression Punishment	.19	.01	.01

Given the significant multivariate effect, univariate ANCOVAs were used as a follow-up to the MANCOVA, with trait mindfulness (CAMS-R) entered as a covariate, examining the effect of experimental condition on negative affect at each of the three time points separately. A significant effect was found at Time Two, $F(2, 69) = 5.825, p = .005$, but not at Time Three, indicating significant differences in negative affect levels between at least two experimental conditions at time two (directly after the mortality salience induction). Post hoc comparisons for the time 2 analysis using Fisher's LSD indicated significantly less negative affect in the mindfulness condition than in the worrying condition at time two, with a mean difference of $-4.71, p = .003$ (see Figure 1),

but no significant difference between the mindfulness and mind-wandering condition was found.

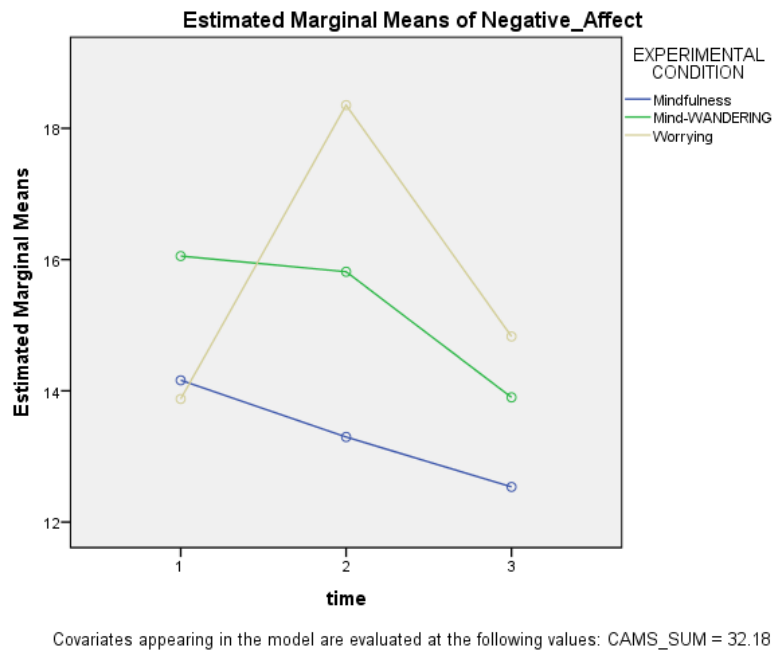


Figure 1. Negative Affect Across Experimental Conditions at Times One, Two, and Three

A follow-up repeated measures ANOVA was conducted to examine whether participants in the mindfulness condition experienced a decrease in negative affect over the course of the experiment. No significant change in negative affect was found between any of the three time points for individuals in the mindfulness condition, $F(2, 42) = 2.26$, $p = .11$.

Effect of Experimental Condition on Number of Words Completed

A follow-up ANCOVA was also conducted to examine the effect of experimental condition on number of death-related word fragments completed on the fragment task, with individuals' KIMS scores entered as a covariate. A significant effect was found, $F(2, 59) = 4.613$, $p = .014$. Pairwise comparisons using Fisher's LSD assessed specific

differences between each of the three experimental conditions. A pairwise comparison first compared the number of death-related words completed between the mindfulness condition ($M = 2.26, SD = .99$) and the worrying condition ($M = 2.95, SD = .921$). The mean difference of .78 between the groups was statistically significant ($p = .017$), indicating fewer death-related words were completed in the mindfulness condition than in the worrying condition. A pairwise comparison then compared the number of death-related words completed between the mind-wandering condition ($M = 2.26, SD = 1.28$) and the worrying condition. Again, the mean difference of .85 was statistically significant ($p = .007$), indicating fewer death-related words were completed in the mind-wandering condition than in the worrying condition. No significant difference in number of completed word fragments was found between the mindfulness and mind-wandering conditions (see Figure 2).

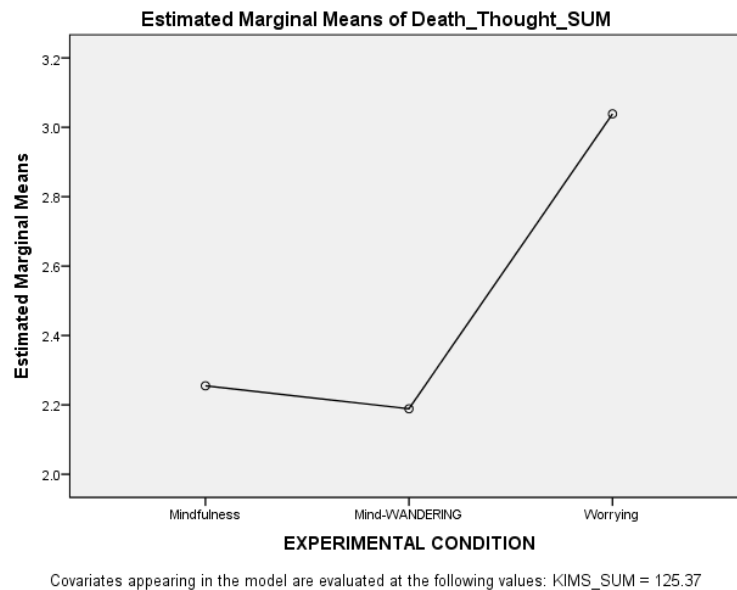


Figure 2. Mean completed word fragments across experimental conditions

Effect of Experimental Condition on Response to Moral Transgression

A follow-up ANOVA was conducted to examine the effect of experimental condition on participants' responses to the Multidimensional Social Transgression Scale. Experimental condition was not found to have a significant effect on participants' responses when simultaneously separating scores across both severity and punishment as well as across interpersonal versus intrapersonal transgressions.

CHAPTER IV – DISCUSSION

Conclusions

The present study sought to investigate whether individuals who underwent a brief mindfulness induction would express fewer negative responses to a mortality salience induction than individuals who did not receive a mindfulness induction prior to exposure to mortality salience. Negative responses were measured in three ways: Proximal defense mechanisms, as measured by a word fragment task in which a higher number of death-related words completed implied a more defensive response; distal defense mechanisms, in which higher ratings of offense severity and deserved punishment on the MSTS implied a more defensive response; and negative affect, as measured by the PANAS. Three experimental conditions were utilized: Mindfulness, wherein participants engaged in a ten-minute mindfulness meditation exercise; Mind-Wandering, wherein participants were instructed to allow their thoughts to wander for ten minutes; and Worrying, wherein participants were instructed to think of their greatest worries across a number of domains, then imaginably guided through the worst-case outcome for each of those worries. Individuals in the Worrying condition expressed greater proximal defense responses than individuals in the Mindfulness and Mind-Wandering conditions, who did not differ. Likewise, participants in the Worrying condition endorsed higher levels of negative affect after the mortality salience induction than did individuals in the Mindfulness or Mind-Wandering condition, who did not differ. No significant differences were found across groups on measures of distal defensive responses.

Partial support was found for Hypothesis A, which stated that individuals in the Mindfulness group would complete fewer death-related word fragments than those not in the Mindfulness group. Although participants in the Mindfulness group completed significantly fewer death-related word fragments than those in the Worrying group, there was no statistically significant difference in number of word fragments completed between those in the Mindfulness group and those in the Mind-Wandering group. Because the Mindfulness condition was found to be essentially equal to the Mind-Wandering condition in terms of diminishing proximal defense mechanisms, the Mindfulness induction was not more effective than the Mind-Wandering condition. The most that can be confidently concluded is that both the Mindfulness and Mind-Wandering conditions were more effective than active worrying when confronted with mortality salience. Given that the Mind-Wandering condition was essentially neutral in terms of emotional manipulation, it is possible that this effect reflects an enhancement of death-related anxiety as a result of active worrying, rather than an indication that either mind-wandering or mindfulness produced a positive effect.

No support was found for Hypothesis B, that individuals in the Mindfulness condition would endorse less severe punishments toward the hypothetical antagonists of the MSTs, and would interpret the moral transgressions described in the MSTs as less severe in nature. Unlike in Hypotheses A and C, no differences were found between any of the three groups when comparing their respective scores on this measure.

It is unclear as to why mindfulness was found to be more effective at reducing negative responses than worrying in Hypotheses A and C, but had no significant effect with regards to Hypothesis B. However, some consideration must be given to the fact that

studies utilizing the MSTS are sparse, and further studies must be conducted using the measure before it can be confidently deemed appropriate as a measure of distal defense responses to mortality salience. Furthermore, Niemiec et al. (2010) found that the MSTS only yielded significant differences in response patterns between a mortality salience condition and a control condition when comparing individuals with below average trait mindfulness. Accordingly, no difference in response patterns was found in individuals with high trait mindfulness. It may be worthwhile to consider, then, that scores on the MSTS may be more sensitive to influence from trait mindfulness as a broader personality trait than to experimental manipulation. Partial support for the idea that MSTS scores are more heavily influenced by trait mindfulness than by experimental condition may be found when considering that both the PHLMS and KIMS measures of trait mindfulness were significantly correlated with intrapersonal offense severity as measured by the MSTS, albeit in the opposite direction as hypothesized (high trait mindfulness was associated with harsher judgments of severity). Furthermore, Niemiec et al. (2010) found that MSTS scores only differed between individuals who had and had not been exposed to a mortality salience induction when such individuals scored low (-1 SD) on trait mindfulness. Conversely, no difference in MSTS scores was found in individuals with high trait mindfulness (+1 SD) regardless of whether or not they had undergone a mortality salience induction. It is also worth reiterating that the MSTS was originally constructed for and tested with a sample of Israeli undergraduate students, and that the number and content of questions used in the original Florian and Mikulincer (1997) study differs from the measure as used by Niemiec et al. (2010) and in the present study, given that some items that were culturally irrelevant to the current study's sample were deleted.

Thus, the form of the MSTS as used in the present study may not be functioning or have the same degree of validity as in previous studies.

Partial support was found for Hypothesis C, which stated that individuals in the Mindfulness condition would report lower levels of negative affect after exposure to the mortality salience induction compared to the other conditions. As in Hypothesis A, mindfulness was found to be more effective than worrying in diminishing negative responses to mortality salience. However, again, the effect of mindfulness was not significantly different from mind-wandering. With this in mind, an examination of the separation between negative affect scores across conditions at time point two does allow for the possibility of a noteworthy division between the three conditions that was not detected due to lack of statistical power (see Figure 1). It is hypothesized that, given a larger sample size, this pattern would hold and achieve statistical significance. Along the same line of thought, it is not out of the question to hypothesize that a larger sample size would yield significant results when assessing whether the mindfulness induction resulted in a steady decrease in negative affect from baseline to termination of the study. Based on a post-hoc power analysis, and assuming the current effect sizes hold, approximately eighty-one participants would be needed in both the Mindfulness and Mind-Wandering groups for the Time 2 negative affect differences across the groups to be statistically significant.

Nonetheless, the present study has yielded insufficient evidence to conclude that a brief mindfulness exercise is superior to simple distraction when managing negative defensive responses to mortality salience. Rather than saying that mindfulness produces a more positive effect than mind-wandering, the most that can be confidently said is that

worrying produces a more negative effect than the other two alternatives. At least three potential explanations exist for this outcome: The first possibility is that a brief mindfulness exercise, when applied by an untrained individual, is simply insufficient at yielding better results than everyday mind-wandering due to lack of mindfulness training or practice, or due to simple unsuitability for mindfulness to be applied in this context. Results from Hypothesis A, wherein it was clear that no differences in outcomes between the Mindfulness and Mind-Wandering conditions occurred, provides some support for this line of thinking.

Secondly, the motivation of the participants in the Mindfulness condition must be taken into account. Some degree of concentrated attention is required in order to utilize mindfulness skills, whereas no effort or skill is necessary to engage fully in the Mind-Wandering condition. With this in mind, most participants in the Mindfulness condition reported a relatively high degree of effort in following the instructions presented in the mindfulness meditation exercise. A possible consideration is that, regardless of one's motivation, self-inducing a mindful state is a skill that requires sustained practice over time. A participant's effort in following the instructions presented may not reflect their actual success in doing so. It is therefore possible that a stronger effect would be seen in the Mindfulness group after a sustained period of practice in utilizing mindfulness techniques.

Alternatively, one may hypothesize that there is still hope for mindfulness as a tool in guarding against at least some of the negative effects of death-related anxiety. Although the present study lacked the statistical power necessary to yield statistical significance for this effect size, the pattern of negative affect scores identified at Time 2,

as well as the potential trend of diminishing negative affect throughout the course of the study, points toward the possibility of mindfulness being able to significantly buffer death-related anxiety in the face of mortality salience in a manner more beneficial than mind-wandering. In the context of the present evidence, however, these hypotheses lack substantiating data and must be investigated in the context of a replicated study with a larger sample size.

Limitations

The present study must be considered within the context of at least three limitations. First, the study may have suffered from a small sample size relative to the size of the effect that was observed, resulting in a lack of statistical significance for an effect that may be deemed noteworthy. The present sample size was chosen based upon a power analysis using a medium effect size, which is what was achieved when comparing the Mindfulness group to the Worry group, but not when comparing the Mindfulness to the Mind-Wandering group. Approximately 20 to 27 individuals were included in each condition across all statistical analyses, with one isolated incident in which only 19 participants in the Mindfulness condition could be included in the word fragment task analyses due to participant error in completing the task which rendered some data unusable. By way of contrast, recent studies by Niemiec et al. (2010) utilized sample sizes of up to 200 participants, split up across 2-4 groups. These sample sizes occasionally surpassed the minimum number of participants to achieve significance given the effect sizes achieved in these studies. For example, Niemiec's study utilizing the MSTTS, with a sample size of 128, reported significant absolute value beta coefficients of

between .18 and .28. Replications of the present study should strive to attain large sample sizes so as to increase statistical power.

Secondly, as stated before, the MSTTS may not have been the optimal means of investigating distal defense responses to the mortality salience induction. Unlike the word fragment task, the MSTTS has been utilized in comparatively few studies. A study by Niemiec et al. (2010) found no difference in MSTTS scores between mortality salient participants and neutral participants when participants were high in trait mindfulness, but did find a difference in score when participants were low in trait mindfulness. This indicates that MSTTS score may be moderated by trait mindfulness. Accordingly, it may be that trait mindfulness has a greater effect on MSTTS score than a brief mindfulness induction may be able to achieve. The series of studies which originally proposed use of the measure (Florian & Mikulincer, 1997) was conducted using a larger set of items than the present study and utilized a sample of notably different culture, ethnicity, and nationality. The evidence garnered from the present study's analysis of Hypothesis B may therefore be of limited use when compared with the evidence presented in accordance with Hypotheses A and C.

Thirdly, it is worth noting that, because the PANAS was not administered between the experimental condition and the mortality salience induction, it is difficult to ascertain the extent to which negative affect was changed by the mortality salience induction itself, versus the experimental condition inductions themselves. Nonetheless, differences across groups on the word fragment task do seem to indicate that the mortality salience induction had at least some lasting effect.

Future Directions

Although the present study provides noteworthy evidence suggesting the effectiveness of mindfulness over worry and perseveration when confronted with death-related anxiety, the results of the present study provide no evidence that mindfulness yields significant benefits when compared with simply distracting oneself from threatening thoughts. The results of the present study are currently unclear as to whether the lack of evidence supporting mindfulness's superiority over mind-wandering, particularly in the realm of diminishing and guarding against negative affect, was due to a true lack of difference between the two conditions, or whether a lack of statistical power could partially explain the lack of significant results. For example, although as few as 81 participants per group could potentially yield significant differences between all conditions when measuring negative affect at Time 2, the present study only managed between 20 and 30 participants per group. Therefore, future studies should utilize a larger sample size to specifically investigate differences between mindfulness and neutral conditions in the context of death-related anxiety.

It is possible that a greater effect may be seen if the mortality salience induction preceded the experimental manipulation. The effects of the Mindfulness condition, presented immediately after the mortality salience condition, may more effectively counteract anxiety instilled by the mortality salience induction than in the present study. Conversely, the present study sought only to buffer the effects of mortality salience. A future study in which the order of the mortality salience induction and the experimental manipulation were reversed may compare the effect of utilizing mindfulness skills in response to distressing stimuli versus prior to distressing stimuli.

A few noteworthy correlations between trait mindfulness and the other dependent variables were also found by the present study. In particular, trait mindfulness was highly negatively correlated with number of death-related words completed on the word fragment task, indicating that mindfulness as a personality trait may play a significant part in modifying internalized defense mechanisms in response to mortality salience. Likewise, trait mindfulness was highly negatively correlated with negative affect at both time points after the mortality salience induction, also indicating that mindfulness as a personality trait may similarly play a large part in buffering negative affective response to stimuli which invoke death-related anxiety. It is worth reiterating that these correlations were compared with the total sample, regardless of condition, indicating that trait mindfulness may be a larger predictor of response to mortality salience than individual approach to dealing with mortality salience (e.g., mindfulness, mind-wandering, worrying) in certain contexts.

Research by Niemiec et al. (2010) found a significant interaction between trait mindfulness and experimental condition when measuring MSTS scores across participants who had undergone a mortality salience induction and those in a control group. Given the correlational significance of trait mindfulness as it pertains to the present study, the field would benefit from future studies examining the extent to which trait mindfulness may moderate the effect of the experimental manipulation.

As stated above, mindfulness skills must be diligently practiced over an extended period of time in order to build enough skill to exact maximum benefit. The present study utilized inexperienced undergraduate students with no previous training in mindfulness skills. It is possible that the Mindfulness condition would yield larger effects if it utilized

participants who practiced mindfulness skills regularly and/or had received formal training. A study in which inexperienced participants regularly practiced mindfulness skills may find more profound changes in response to mortality salience when comparing defensive responses and negative affect over multiple time points. Likewise, a study which exclusively utilized experienced meditators as participants may yield larger effects than the present study, which was limited to individuals with no prior experience or training in mindfulness skills.

Conclusion

The present study sought to examine the effect of a brief mindfulness induction on responses to mortality salience. By administering a mortality salience induction after the mindfulness induction, participants' responses to mortality salience could be measured in the context of whether they had received a mindfulness induction or other experimental treatment (mind-wandering, worrying). Results indicate that mind-wandering and mindfulness are both superior to worry and perseveration in guarding against negative affect as well as in diminishing proximal defense mechanisms in response to mortality salience. However, results were insufficient to conclude that mindfulness is a superior approach to simple distraction when confronted with death-related anxiety. With that in mind, some preliminary data points toward possible future demonstration of the superior efficacy of mindfulness in dealing with these difficult thoughts, given enough statistical power. Correlations examined during the course of the study also indicate that trait mindfulness may be a significant predictor of individual responses to mortality salience, and future research should examine the extent to which trait mindfulness versus behavioral response to mortality salience affects final outcomes.

APPENDIX A –Word Completion Task

We are simply pre-testing this questionnaire for future studies. Please complete the following by filling letters in the blanks to create words. Please fill in the blanks with the first word that comes to mind. Write one letter per blank. Some words may be plural. Thank you.

1. BUR _ _ D

2. PLA _ _

3. _ _ OK

4. WAT _ _

5. DE _ _

6. MU _ _

7. _ _ NG

8. B _ T _ LE

9. M _ J _ R

10. P _ _ TURE

11. FL _ W _ R

12. GRA _ _

13. K _ _ GS

14. CHA _ _

15. KI _ _ ED

16. CL _ _ K

17. TAB _ _

18. W _ _ DOW

19. SK _ _ L

20. TR _ _

21. P _ P _ R

22. COFF _ _

23. _ O _ SE

24. POST _ _

25. R _ DI _

APPENDIX B – Multidimensional Social Transgression Scale Vignettes

Interpersonal Transgressions

"The vehicle hit me, but my son is the victim," said the teacher who was hit in front of his son's eyes while a young driver drove through the residential area at a speed of 100 mph. "Half a year after the accident, I have totally recovered, and he is still afraid of the sound of a car. He can't travel in a moving vehicle. He walks to and from school, which is two miles from our house, trying to avoid all roads. The boy who was happy and carefree has turned anxious and paranoid."

A false identification of the AIDS virus in the body of a young man caused him social isolation. "My girlfriend and my close friends all became afraid and left me. Even my peers in my dance club, which was the focus of my social life, rejected me from the group. I became dangerous to society. Even now, when the mistake is clear, people are still nervous, not willing to take risks, and I blame no one but the doctor who was too busy to take a second look at the test results."

A faulty diagnosis of the specialist brought turmoil to the family. The doctor diagnosed the girl with a rare liver disease that required treatment overseas. The parents sank into debt to finance the stay abroad, and the treatment was found to be unnecessary. The father said in anger, "When he heard of the mistake, the doctor said, 'Be happy that she's healthy,' but it's very hard to be happy. We've been left without an apartment, when we're barely able to feed our four children and all their

childhood pleasures were denied them."

The boy's social life was destroyed by the accident caused by the drunken driver who veered toward the sidewalk and hit the boy. The child said, "For a year I had to rest in the hospital and at home. My body gradually recovered, but I was forgotten by my friends, who went on with their lives. I don't have any way to go back to the ways things were—they all went to junior high in a different school, and I was left back a grade and have to start again. I don't belong to the old cliques or the new ones. I simply don't belong."

"The mother's wounds will heal, but her daughter's wounded soul will forever remain," according to the psychologist who treated the girl upon hearing of the capture of the driver of the Subaru who hit the mother and escaped. The daughter, age five, who was orphaned from her father when she was one year old, was separated from her mother due to her mother's hospitalization for over a year.

Personal Transgressions

The doctor mixed up the records of two patients with the same last name and amputated the leg of the wrong patient. 'I was anesthetized for a simple operation on my knee and woke up without a leg. It's impossible that my leg is gone," said the woman, staring in disbelief at the empty space on her bed where her left leg was supposed to be.

The talented pianist's fingers betrayed him; his typically lighthanded playing, his unique touch on the keys, the familiar virtuosity

were not seen or heard. . . . The young genius's first concert following his recovery from the accident conclusively proved that the young girl who drove through a red light damaged his body lightly, but destroyed the pianist's career.

A negligent operation of removing a blister from the vocal chords of the promising opera singer caused her perpetual hoarseness. The woman sued the surgeon for the loss of her musical future. "I can talk, sing in the shower, maybe even for friends," she told the judge, "but since my childhood I wanted to be an opera singer. I have the talent and I had the appropriate voice, and now it's gone forever."

"A dreadful emptiness surrounds me, childhood memories, memories of my dead parents, the songs, the loves . . . all my past erased as if it never was." This emotional description was heard from a young man who was hurt in a car accident when a commercial vehicle tailgated and crashed forcefully into the young man's car. His head injury caused the erasure of his life's memories.

The owner of a cement factory was sued for the youth's loss of sight. His promise made 15 years ago to install new filters on his smokestacks wasn't fulfilled because of economic reasons. The youth, who lived his whole life neighboring the factory, said: "Their greed cost me my health; any financial compensation, no matter how large—I will never recover from this loss."

APPENDIX C – Philadelphia Mindfulness Scale

Instructions: Please circle how often you experienced each of the following statements *within the past week*.

1. I am aware of what thoughts are passing through my mind.
2. I try to distract myself when I feel unpleasant emotions.
3. When talking with other people, I am aware of their facial and body expressions.
4. There are aspects of myself I don't want to think about.
5. When I shower, I am aware of how the water is running over my body.
6. I try to stay busy to keep thoughts or feelings from coming to mind.
7. When I am startled, I notice what is going on inside my body.
8. I wish I could control my emotions more easily.
9. When I walk outside, I am aware of smells or how the air feels against my face.
10. I tell myself that I shouldn't have certain thoughts.
11. When someone asks how I am feeling, I can identify my emotions easily.
12. There are things I try not to think about.
13. I am aware of thoughts I'm having when my mood changes.
14. I tell myself that I shouldn't feel sad.
15. I notice changes inside my body, like my heart beating faster or my muscles getting tense.
16. If there is something I don't want to think about, I'll try many things to get it out of my mind.
17. Whenever my emotions change, I am conscious of them immediately.
18. I try to put my problems out of mind.

19. When talking with other people, I am aware of the emotions I am experiencing.
20. When I have a bad memory, I try to distract myself to make it go away.

APPENDIX D – Cognitive and Affective Mindfulness Scale—Revised

1. It is easy for me to concentrate on what I am doing
2. I am preoccupied by the future.
3. I can tolerate emotional pain.
4. I can accept things I cannot change
5. I can usually describe how I feel at the moment in considerable
6. I am easily distracted.
7. I am preoccupied by the past.
8. It's easy for me to keep track of my thoughts and feelings.
9. I try to notice my thoughts without judging them.
10. I am able to accept the thoughts and feelings I have.
11. I am able to focus on the present moment.
12. I am able to pay close attention to one thing for a long period of time

APPENDIX E – Kentucky Inventory of Mindfulness Scales

1. I notice changes in my body, such as whether my breathing slows down or speeds up.
2. I'm good at finding the words to describe my feelings.
3. When I do things, my mind wanders off and I'm easily distracted.
4. I criticize myself for having irrational or inappropriate emotions.
5. I pay attention to whether my muscles are tense or relaxed.
6. I can easily put my beliefs, opinions, and expectations into words.
7. When I'm doing something, I'm only focused on what I'm doing, nothing else.
8. I tend to evaluate whether my perceptions are right or wrong.
9. When I'm walking, I deliberately notice the sensations of my body moving.
10. I'm good at thinking of words to express my perceptions, such as how things taste, smell, or sound.
11. I drive on "automatic pilot" without paying attention to what I'm doing.
12. I tell myself that I shouldn't be feeling the way I'm feeling.
13. When I take a shower or a bath, I stay alert to the sensations of water on my body.
14. It's hard for me to find the words to describe what I'm thinking.
15. When I'm reading, I focus all my attention on what I'm reading.
16. I believe some of my thoughts are abnormal or bad and I shouldn't think that way.
17. I notice how foods and drinks affect my thoughts, bodily sensations, and emotions.
18. I have trouble thinking of the right words to express how I feel about things.
19. When I do things, I get totally wrapped up in them and don't think about anything else.

20. I make judgments about whether my thoughts are good or bad.
21. I pay attention to sensations, such as the wind in my hair or sun on my face.
22. When I have a sensation in my body, it's difficult for me to describe it because I can't find the right words.
23. I don't pay attention to what I'm doing because I'm daydreaming, worrying, or otherwise distracted.
24. I tend to make judgments about how worthwhile or worthless my experiences are.
25. I pay attention to sounds, such as clocks ticking, birds chirping, or cars passing.
26. Even when I'm feeling terribly upset, I can find a way to put it into words.
27. When I'm doing chores, such as cleaning or laundry, I tend to daydream or think of other things.
28. I tell myself that I shouldn't be thinking the way I'm thinking.
29. I notice the smells and aromas of things.
30. I intentionally stay aware of my feelings.
31. I tend to do several things at once rather than focusing on one thing at a time.
32. I think some of my emotions are bad or inappropriate and I shouldn't feel them.
33. I notice visual elements in art or nature, such as colors, shapes, textures, or patterns of light and shadow.
34. My natural tendency is to put my experiences into words.
35. When I'm working on something, part of my mind is occupied with other topics, such as what I'll be doing later, or things I'd rather be doing.
36. I disapprove of myself when I have irrational ideas.
37. I pay attention to how my emotions affect my thoughts and behavior.

38. I get completely absorbed in what I'm doing, so that all my attention is focused on it.

39. I notice when my moods begin to change.

APPENDIX F – Positive Affect Negative Affect Scale

Subjects are asked to rate on a 1-5 scale how they feel *right now* (that is, at the present moment) with regards to each of the following emotions:

Enthusiastic

Interested

Determined

Excited

Inspired

Alert

Active

Strong

Proud

Attentive

Scared

Afraid

Upset

Distressed

Jittery

Nervous

Ashamed

Guilty

Irritable

Hostile

APPENDIX G – IRB Approval Letter



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NOTICE OF COMMITTEE ACTION

The project has been reviewed by The University of Southern Mississippi Institutional Review Board in accordance with Federal Drug Administration regulations (21 CFR 26, 111), Department of Health and Human Services (45 CFR Part 46), and university guidelines to ensure adherence to the following criteria:

- The risks to subjects are minimized.
- The risks to subjects are reasonable in relation to the anticipated benefits.
- The selection of subjects is equitable.
- Informed consent is adequate and appropriately documented.
- Where appropriate, the research plan makes adequate provisions for monitoring the data collected to ensure the safety of the subjects.
- Where appropriate, there are adequate provisions to protect the privacy of subjects and to maintain the confidentiality of all data.
- Appropriate additional safeguards have been included to protect vulnerable subjects.
- Any unanticipated, serious, or continuing problems encountered regarding risks to subjects must be reported immediately, but not later than 10 days following the event. This should be reported to the IRB Office via the "Adverse Effect Report Form".
- If approved, the maximum period of approval is limited to twelve months.
Projects that exceed this period must submit an application for renewal or continuation.

PROTOCOL NUMBER: 15080303
PROJECT TITLE: Mindfulness and Death Anxiety
PROJECT TYPE: New Project
RESEARCHER(S): David Schultz
COLLEGE/DIVISION: College of Education and Psychology
DEPARTMENT: Psychology
FUNDING AGENCY/SPONSOR: N/A
IRB COMMITTEE ACTION: Expedited Review Approval
PERIOD OF APPROVAL: 08/04/2015 to 08/03/2016
Lawrence A. Hosman, Ph.D.
Institutional Review Board

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.
- Arndt, J., Greenberg, J., Pyszczynski, T., & Solomon, S. (1997). Subliminal exposure to death-related stimuli increases defense of the cultural worldview. *Psychological Science*, *8*(5), 379-385.
- Arndt, J., Schimel, J., & Goldenberg, J. L. (2003). Death can be good for your health: fitness intentions as a proximal and distal defense against mortality salience. *Journal of Applied Social Psychology*, *33*(8), 1726-1746.
- Baer, R. A., Smith, G. T., & Allen, K. B. (2004). Assessment of mindfulness by self-report: the Kentucky inventory of mindfulness skills. *Assessment*, *11*(3), 191-206.
- Black, D. S. (2009). A brief definition of mindfulness. *Behavioral Neuroscience*, *7*(2), 109.
- 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.
- 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.
- Burke, B. L., Martens, A., & Faucher, E. H. (2010). Two decades of terror management theory: A meta-analysis of mortality salience research. *Personality and Social Psychology Review*, *14*(2), 155-195.

- Cardaciotto, L., Herbert, J. D., Forman, E. M., Moitra, E., & Farrow, V. (2008). The assessment of present-moment awareness and acceptance: The Philadelphia mindfulness scale. *Assessment, 15*(2), 204-223.
- Chambers, R., Gullone, E., & Allen, N. B. (2009). Mindful emotion regulation: An integrative review. *Clinical Psychology Review, 29*(6), 560-572.
- Feldman, G., Hayes, A., Kumar, S., Greeson, J., & Laurenceau, J. P. (2007). Mindfulness and emotion regulation: The development and initial validation of the Cognitive and Affective Mindfulness Scale-Revised (CAMS-R). *Journal of Psychopathology and Behavioral Assessment, 29*(3), 177-190.
- Florian, V., & Mikulincer, M. (1997). Fear of death and the judgment of social transgressions: A multidimensional test of terror management theory. *Journal of Personality and Social Psychology, 73*(2), 369.
- Gailliot, M. T., Schmeichel, B. J., & Baumeister, R. F. (2006). Self-regulatory processes defend against the threat of death: Effects of self-control depletion and trait self-control on thoughts and fears of dying. *Journal of Personality and Social Psychology, 91*(1), 49.
- Greenberg, J., Pyszczynski, T., & Solomon, S. (1986). The causes and consequences of a need for self-esteem: A terror management theory. In *Public Self and Private Self* (pp. 189-212). New York, NY: Springer.
- Greenberg, J., Simon, L., Pyszczynski, T., Solomon, S., & Chatel, D. (1992). Terror management and tolerance: Does mortality salience always intensify negative reactions to others who threaten one's worldview? *Journal of Personality and Social Psychology, 63*(2), 212.

- Greenberg, J., Pyszczynski, T., Solomon, S., Simon, L., & Breus, M. (1994). Role of consciousness and accessibility of death-related thoughts in mortality salience effects. *Journal of Personality and Social Psychology*, *67*(4), 627.
- Greenberg, J., Solomon, S., & Pyszczynski, T. (1997). Terror management theory of self-esteem and cultural worldviews: Empirical assessments and conceptual refinements. *Advances in Experimental Social Psychology*, *29*, 61-139.
- Grossman, P., Niemann, L., Schmidt, S., & Walach, H. (2004). Mindfulness-based stress reduction and health benefits: A meta-analysis. *Journal of psychosomatic research*, *57*(1), 35-43.
- Harris, S. (2013). *Guided Meditation with Sam Harris – Short Version* [Audio]. Retrieved from <https://www.youtube.com/watch?v=pzMhLmErz5Q>
- John, O. P., Donahue, E. M., & Kentle, R. L. (1991). The Big Five Inventory--Versions 4a and 54. Berkeley, CA: University of California, Berkeley, Institute of Personality and Social Research.
- Kabat-Zinn, J. (1994) *Wherever you go, there you are: Mindfulness meditation in everyday life*. New York, NY: Hyperion Books.
- Kashdan, T. B., & Rottenberg, J. (2010). Psychological flexibility as a fundamental aspect of health. *Clinical Psychology Review*, *30*(7), 865-878.
- Kesebir, P. (2014). A quiet ego quiets death anxiety: Humility as an existential anxiety buffer. *Journal of Personality and Social Psychology*, *106*(4), 610.
- Niemiec, C. P., Brown, K. W., Kashdan, T. B., Cozzolino, P. J., Breen, W. E., Levesque-Bristol, C., & Ryan, R. M. (2010). Being present in the face of existential threat:

The role of trait mindfulness in reducing defensive responses to mortality salience. *Journal of Personality and Social Psychology*, 99(2), 344.

Quaglia, J. T., Brown, K. W., Lindsay, E. K., Creswell, J. D., & Goodman, R. J. (2015).

From conceptualization to operationalization of mindfulness. In Brown, K. W., Creswell, J. D., & Ryan, R. M. (Eds.), *Handbook of Mindfulness: Theory, research, and practice* (pp. 151-170). New York, NY: Guilford Press.

Routledge, C., Arndt, J., & Goldenberg, J. L. (2004). A time to tan: Proximal and distal effects of mortality salience on sun exposure intentions. *Personality and Social Psychology Bulletin*, 30(10), 1347-1358.

Simon, L., Arndt, J., Greenberg, J., Pyszczynski, T., & Solomon, S. (1998). Terror management and meaning: Evidence that the opportunity to defend the worldview in response to mortality salience increases the meaningfulness of life in the mildly depressed. *Journal of Personality*, 66(3), 359-382.

Sliter, M. T., Sinclair, R. R., Yuan, Z., & Mohr, C. D. (2014). Don't fear the reaper: Trait death anxiety, mortality salience, and occupational health. *Journal of Applied Psychology*, 99(4), 759.

Vasey, M. W., & Borkovec, T. D. (1992). A catastrophizing assessment of worrisome thoughts. *Cognitive Therapy and Research*, 16(5), 505-520.

Watson, D., Clark, L. A., & 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.

