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Relationship of Mindfulness to Worldview Defense When Mortality is Salient

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Walden University

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Blake Ausmus

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Walden University
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Abstract

Relationship of Mindfulness to Worldview Defense When Mortality is Salient

by

Blake Ausmus

MS, Walden University, 2011

BA, University of Calgary, 2009

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

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Psychology

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Abstract

Humans value self-preservation, and therefore that which is perceived to threaten survival should cause stress. However, humans have also developed the understanding of their own mortality, meaning that they cognitively understand that death is inevitable. The conflict arising from these opposing constructs holds the potential to cause anxiety. Interestingly, this anxiety is not easily observed in most. Terror management theory posits that there are buffer systems in place that help to keep death anxiety at bay so that humans are able to continue to function in their daily lives. These buffers include becoming more stringent to one's worldviews and less tolerant of the worldviews of others. These tendencies can become maladaptive since they complicate social interactions. Mindfulness, as measured by the Philadelphia Mindfulness Scale (PHLMS) is known to be correlated with stress and anxiety management. This research was designed to investigate the relationship between mindfulness and worldview defensiveness when mortality is made salient. Overall, the responses of 91 participants were compared. With the use of a multiple regression analysis, no significant correlation was found between mindfulness and worldview defensiveness in the participants. Self-esteem was found to be positively correlated with worldview defense. These results should be interpreted with caution, considering the fact that, at the outset of the study, individuals began participation possibly already primed with thoughts of death due to the COVID-19 pandemic happening worldwide at the time of the study. However, in spite of the limitations, this research may help achieve positive social change by adding to the understanding of the relationship between mindfulness and terror management.

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Chapter 1: Introduction to the Study

Like any other species known, humans value self-preservation, and therefore that which is perceived to threaten survival should cause stress. However, something that is observed to not be consistent among all species is that humans have also developed the understanding of their own mortality, meaning that they are cognitively aware that death is inevitable. As such, an internal conflict of desiring survival, but knowing that death must assuredly happen to all, creates what is referred to as *death anxiety*. Scientifically, death anxiety can be manipulated by introducing reminders of death to an individual. This process is known as *mortality salience* (MS). Interestingly, the anxiety that would be expected to occur with an increased awareness of one's mortality does not produce the same physical responses commonly associated with anxiety. Ongoing research is helping to increase our understanding of what coping strategies are used to moderate death anxiety.

It is postulated by Greenberg et al. (1986) that when confronted by death anxiety individuals will defend their worldviews, which are the spiritual and philosophical frameworks of how the world should, or does, operate. These defense mechanisms can be beneficial as they help strengthen in-group relations, but they can also be harmful as they decrease tolerance of differing worldviews and may foster overt hostility to out-groups. Thus, a system used to help reduce the anxiety caused by MS could essentially improve human relations by lessening impatience and intolerance of others.

Mindfulness is a practice, drawing from ancient techniques of Buddhism which consists in “the intentional, accepting and non-judgmental focus of one's attention on the

emotions, thoughts and sensations occurring in the present moment” (Zgierska et al., 2009). Researchers have been trying to better understand the mechanisms behind it, as well as determine its effectiveness in a vast array of settings. Interestingly, there has been very little research done to date on the effect of mindfulness on death anxiety in the context of terror management theory (TMT). Empirically, what if any relationship exists between mindfulness and death anxiety remains, to a great degree, unanswered.

In what appears to be the only previously published empirical investigation of mindfulness and death anxiety (Niemic et al., 2010); it was reported that trait mindfulness attenuates defensive responses to death anxiety. In this study, mindfulness was measured by the Mindful Attention Awareness (Brown & Richard, 2003). This scale is intended to measure one’s attention and awareness as a personality trait. According to Cardaciotto et al. (2008) most standard definitions of mindfulness include the two key components of awareness and acceptance. Although there was a significant correlation found, that those higher in mindful attention and awareness showed less reaction to MS, their research did not account for the construct of acceptance. This limits the potential usefulness of the results reported by Niemic et al. (2010). Thus, further investigation is merited to determine the effects of mindfulness, not only including awareness, but also acceptance as a construct.

Problem Statement

As mortality is made salient, coping mechanisms are implemented to mitigate negative effects of the threat of death anxiety. According to terror management health model (TMHM) research done by Goldenberg and Arndt (2008), MS can lead to

improved health behaviors, but other research suggests that it can lead to increases in negative emotions (Routledge et al., 2010) or even mortality (Abel, & Kruger, 2009). These negative effects can impact mental health, physical health, and even public health for better or for worse.

Another problem that exists with the natural coping strategies to mitigate death anxiety is the lack of tolerance for other worldviews, which becomes augmented when primed by thoughts of death. People will tend to adhere to their own opinions without lending way for other value systems. The issues that can arise from this intolerance include aggression (McGregor et al., 1998), negative stereotypes (Castano, 2004), and hate (Brewer, 1999).

Since these issues with anxiety management strategies that are innately employed lead to some of these issues mentioned, it is important to mitigate against these. A possible way to aid in this is to identify and strengthen alternative buffers. Research has been done on self-esteem by Pyszczynski et al. (2004) that supports the theory that self-esteem can act as an alternate buffer to death anxiety. The concept of awareness, as a measure of mindfulness has also been shown to attenuate defensive responses to death anxiety (Niemiec et al., 2010). However, a more in-depth understanding of mindfulness that includes acceptance is needed. This can lead to the potential development of coping strategies, as mindfulness is routinely taught, practiced, and improved upon by individuals throughout the world.

Purpose of the Study

The purpose of this quantitative study was to explore the role played by mindfulness in death-related anxiety. To accomplish this, I carried out an investigation to determine whether higher levels of mindfulness attenuate death-related anxiety, as evidenced through the defending of worldviews.

Research Questions and Hypotheses

RQ1: What is the correlation between an individual's level of mindfulness and the defending of worldviews following MS when controlling for age, sex, and self-esteem?

H_01 : There is no relationship between mindfulness and worldview defense when one is exposed to MS while controlling for age, sex, and self-esteem.

H_a1 : There is a relationship between mindfulness and worldview defense when one is exposed to MS while controlling for age, sex, and self-esteem.

RQ2: What is the correlation between one's age and the defending of worldviews following MS when controlling for level of mindfulness, sex, and self-esteem?

H_02 : There is no relationship between one's age and worldview defense when one is exposed to MS while controlling for level of mindfulness, sex, and self-esteem.

H_a2 : There is a relationship between one's age and worldview defense when one is exposed to MS while controlling for level of mindfulness, sex, and self-esteem.

RQ3: What is the correlation between one's sex and the defending of worldviews following MS when controlling for level of mindfulness, age, and self-esteem?

H_03 : There is no relationship between one's sex and worldview defense when one is exposed to MS while controlling for level of mindfulness, age, and self-esteem.

H_{a3} : There is a relationship between one's sex and worldview defense when one is exposed to MS while controlling for level of mindfulness, age, and self-esteem.

RQ4: What is the correlation between one's self-esteem and the defending of worldviews following MS when controlling for level of mindfulness, age, and sex?

H_{o4} : There is no relationship between one's self-esteem and worldview defense when one is exposed to MS while controlling for level of mindfulness, sex, and self-esteem.

H_{a1} : There is a relationship between one's self-esteem and worldview defense when one is exposed to MS while controlling for level of mindfulness, sex, and self-esteem.

In this study, the dependent variable was worldview defensiveness, which was measured by the participant's level of agreement with, and how they rate the intelligence of the author of short essays with opposing worldviews. The independent variable was the level of mindfulness of the participants, which was measured by a simple mindfulness survey. Covariates include age, sex, and self-esteem, which will be measured using the Rosenberg Self-Esteem Scale (RSES).

Theoretical Framework for the Study

In 1973, Ernest Becker published a book titled *The Denial of Death*, which posits that all human beings understand that they will inevitably die. Therefore, we as humans attempt to find a way to calm that fear and make ourselves have meaning in our allotted timeframe. Graduate students Jeff Greenberg, Sheldon Solomon, and Tom Pyszczynski were enthralled by this book and Becker's ideas and developed the theory that a positive

self-esteem serves as a mechanism to reduce anxiety. They further posited that cultural values and worldviews also help to mitigate against anxiety by providing a meaning to life (Solomon et al., 1991). This theory, TMT, is a well-developed theory that has been evaluated and investigated over decades. As such, TMT offers a valuable framework with an existing paradigm and established research strategies. Specifically, it offers a reliable understanding of the psychological processes that underlie death anxiety and how it interacts with self-esteem and tolerance and defensiveness of worldviews. TMT is explored in greater detail in Chapter 2. In this research, I investigated whether mindfulness can also help to buffer against death anxiety. If high levels of mindfulness are effective at buffering against, or reducing death anxiety, then adherence to culture or worldviews would be less salient.

Nature of the Study

Mindfulness is a state of focusing one's attention on the present moment including one's thoughts, emotions, and sensations in a fashion of nonjudgment and acceptance. The act of being aware of and accepting one's state in a nonjudgmental fashion seems a plausible way to effectively negate the effects of death anxiety. It was expected, then, that individuals who show a higher level of mindfulness would have less need of other coping strategies to be implemented under conditions where mortality is made salient. Improved coping may have positive effects on social, mental, physical, or public health. As will be discussed further in the following chapters, fluctuations in death anxiety are not easily seen under MS conditions. Because natural coping strategies mitigate the anxiety buffer against said anxiety, it is the recruitment of these coping

strategies that can more clearly show an effect of MS. As such, self-esteem and worldview defense were monitored in this research once participants were reminded of their mortality.

In order to measure the effects of mindfulness levels on individuals under conditions of MS, worldview defense was measured after participants were encouraged to consider death and their own mortality. Self-esteem was also measured prior to MS induction and monitored as a covariate. Participants engaged in research by using an online platform in which they were able to participate in questionnaires that measured the variables in question, and tasks to induce thoughts of death and dying. Data were then analyzed to assess the relationship that mindfulness levels have on worldview defensiveness.

Definitions

TMT is described by Greenberg et al. (1986) as an understanding of human behavior, emotion, and thought such as the embracing of cultural beliefs or symbolic systems to manage the conflict that arises in individuals, who innately desire to preserve life but recognize the inevitability of death. Although definitions of mindfulness vary in the literature, Baer (2003) described it as the ability to focus attention on the present without placing judgment. Chapter 3 will offer a more concise definition of all variables in question.

Assumptions

The very core assumption is that of self-preservation evident in humans. TMT posits that individuals search for a sense of immortality, or to preserve their life for as

long as possible. This assumption is debated by Leary and Schreindorfer (1997) and will be further discussed in Chapter 2. A second assumption made is that death anxiety should lead to a paralyzing terror, but this terror is not commonly observed due to the numerous coping mechanisms that have evolved to protect humans from it. As one's mortality is brought to mind, either consciously or subconsciously, we can see effects that can be identified as either positive effects, negative effects, or buffering mechanisms to mitigate those negative effects. Considering that it is not possible to accurately identify that all humans feel the innate desire to preserve life, and that the potential for terror is even more difficult to identify as a common trait due to the coping strategies that are naturally implemented to mitigate against it, it remains that these were underlying assumptions of this research.

Because of the difficulty in verifying honesty of participants' responses, it was assumed that they all answer truthfully. In addition, Williams et al. (2013) posited that eight assumptions must be included in regression analyses. These are (a) the presence of at least two independent variables, (b) that the dependent variable be continuous, (c) that there is a linear relationship between the dependent and independent variables, (d) the observations are independent from each other, (e) homoscedasticity is displayed, (f) multicollinearity is not displayed, (g) there are not significant outliers, and (h) residuals are normally distributed. In the case that these assumptions had not been met, a different test that is nonparametric would have been utilized, since those assumptions do not need to be met for those tests.

Scope and Delimitations

The population studied consisted of U.S. Americans who are 18 years or older, fluent in English, and willing to participate in short tasks and surveys online; these individuals included both males and females who were likely from different socioeconomic groups, races, and religions. The reason this study was limited to U.S. Americans is because the Worldview Defensiveness tool used is based on participants' identifying themselves as such. Because TMT is based on human behavior in an evolutionary model, it is believed that the results of this research are likely to have a high level of generalization to the entire population of the world. However, this was not examined in the present study. Limiting to individuals who have reached the age of majority was done for a number of reasons, including the issue of consent, since this research was done online without in-person contact, and second to reduce the possibility of causing some discomfort by initiating thoughts of death to a vulnerable population. Although one may argue that many subcultures and races exist within the culture of the United States, due to the high number of differences that can exist, it did not seem reasonable to include them all independently in this study. Furthermore, the literature of TMT does not support a significant difference in reactions to MS among different races and subcultures.

Limitations

The results were limited to the validity of the scales used for measuring anxiety and worldview defensiveness. Also, the use of a population who has volunteered to participate in research does limit the ability to generalize results since this population

may be using different cognitive strategies than other groups. Chapter 3 will contain a more complete analysis of each of the measures included and their validity.

An additional limitation is intrinsic to the tool to assess worldview defensiveness. Since it is assuming the worldview of viewing the United States in a positive fashion, if a participant does not hold the worldview of viewing the United States in a positive fashion, the results will be skewed. However, the tool is designed in a way that is quite broad-scoped and does not rely on valuation of a specific political party, but rather the concepts of freedom and opportunity within the United States, which are far less likely to be controversial or valued lowly.

Lastly, the measurement tools used are subjective, and therefore limited to biases of individual participants. However, limiting communication with participants to only prewritten and approved documents helped to mitigate the possibility of my biases affecting results, since there is no change in outcome to the participants regardless of how they respond.

Significance

The investigation has the ability to identify whether or not a high level of mindfulness will attenuate the effects of death anxiety more than a low level of mindfulness. If mindfulness correlates with death anxiety, then an additional coping mechanism to buffer against the negative effects of death anxiety on social, mental, and physical health is identified. This can lead to further research, including developing ways to implement the findings in clinical and personal settings to help reduce the mentioned negative effects of death anxiety.

Summary

In summary, the relationship that exists between mindfulness and human responses to reminders of death and mortality has been studied very little. This research project was conducted as a way to help increase our understanding of this relationship. This was achieved through a quantitative experimental study that measures mindfulness levels and self-esteem, and then after a task that induces thoughts of death, worldview defensiveness was measured. This provided the ability to analyze the relationship between mindfulness and terror management. The following chapter will present a comprehensive review of relevant literature that this research will be based upon, including the current state of our understanding of the topics of mindfulness, self-esteem, and terror management as it relates to death anxiety.

Chapter 2: Literature Review

Because of the human tendency to struggle for survival, and the juxtaposed knowledge that given our mortality, all are susceptible to death, a state of terror would be expected to exist whenever one ponders the idea of death. The underpinnings of this possible experience of terror in the face of contemplating one's mortality is sought to be understood through TMT. Furthermore, research suggests that mindfulness practices can help mitigate anxiety and that mindfulness in the general population correlates with less mood dysregulation. Given this, the purpose of this study is to better understand the potential correlation between mindfulness and death-related anxiety.

Both TMT and mindfulness have been the subject of much empirical research and investigation. Numerous studies have researched these in many different arenas. However, there is limited research on the potential relationship between the two. As such, a clear understanding of the relationship between mindfulness and TMT is yet to be achieved. In this chapter, I present a review of the current literature that is pertinent to what is now understood about TMT and mindfulness including definitions, a brief history, and the current state of each.

Literature Search Strategy

Resources used for the collection of information included the following online search engines: Google Scholar, EBSCO, ebrary by Proquest, Academic Search, PsychArticles, and PsycINFO. Aside from Google Scholar, all of these sources were obtained through Walden University's library services. With few exceptions, the research consisted of scholarly work including peer-reviewed articles and books. Focus was

placed on recently published research. However, some seminal works are cited to provide a brief history of the development of the related fields of study. I also relied on the reference lists provided in many of the articles and book chapters in this literature review as a source for articles.

Key terms used for the literature search included *terror management theory*, *TMT*, *terror management*, *mortality salience*, *death anxiety*, *death-related anxiety*, *existential anxiety*, *mindfulness*, and *facets of mindfulness*. Combinations of terms such were also used such as *mindfulness* and *anxiety*, *terror management theory* and *mindfulness*, *mortality salience* and *anxiety*, *death anxiety* and *mindfulness*, and *existential anxiety* and *mindfulness*.

A stronger emphasis was placed on more recent peer-reviewed research published in the last 5–10 years. However, some seminal works dating back to 1973, including the book *The Denial of Death*, are included in the research. There was little research found that attempts to understand the relationship between mindfulness and death anxiety through the lens of TMT. As such, the correlation between mindfulness and anxiety was examined, where there is a vast amount of research available, and the role that anxiety has in terror management was also investigated.

Theoretical Foundations

Upon reflecting on beginnings of TMT and its struggle to enter mainstream psychology and sociology, Solomon et al. (2004) reported that their theory initially was not well received. When the theory was presented at a meeting of the Society of Experimental Social Psychology in 1984, “renowned psychologists were storming for the

exits” (Solomon et al., 2015). Further to this, an initial review from *American Psychologist* rejected a formal presentation by stating, “I have no doubt that these ideas are of absolutely no interest to any psychologist, alive or dead” (p. 15). Upon further questioning of the reasoning behind this rejection, it was explained that there was a need to empirically investigate the hypotheses presented in TMT. This resulted in the beginning of the scientific study of TMT in the late 1980s, which is carried on today, including through this dissertation.

Jeff Greenberg, Sheldon Solomon, and Tom Pyszczynski developed TMT after being influenced by Ernest Becker’s Pulitzer Prize-winning book, *The Denial of Death*, which was published in 1973. This book caught the attention of many as it attempted to explain human behavior. Becker (1973) asserted that because humans are able to comprehend the inevitability of death, yet have the desire to continue living, there is an internal conflict that logically should cause anxiety, or as Becker described it, a “terror” (p. 15). Becker posited that it is in an effort to manage this anxiety that societies create many aspects of culture. In a review of Becker’s book, Levitt (1974) succinctly expressed that Freud believed that sexuality was the primary motivator in human behavior, whereas Becker argued that the fear of death is the primary motivator. For the purposes of this dissertation, *terror management theory* is defined as the proposed understanding of the psychological conflict that arises from the instinctive desire to survive challenged by the knowledge that death comes to us all, and the measures taken by individuals to mitigate the anxiety produced by this internal psychological conflict.

By 2010, Burke et al. (2010) carried out a meta-analysis on 277 research experiments related to TMT. The authors concluded that the empirical evidence supporting the hypothesis of TMT, which is that thoughts of death affect us more than what we consciously understand, is “robust and produces moderate to large effects” (Burke et al., 2010, p. 187). The effect size of MS was found to be high overall ($r = .35$), which places it in the 80th percentile for effect size among social psychology experiments. The research examined also demonstrated that self-esteem and cultural worldviews can both act as buffers to mitigate the anxiety produced by death-related thought.

TMT Hypotheses and Assumptions

Research continued over the years, and by 2014, Maxfield, John, and Pyszczynski conducted a review of the literature on TMT. The research included over 500 experiments conducted in over 20 countries testing TMT empirically. The importance of TMT is far-reaching, as Maxfield et al. argued, “terror mismanagement plays an important role in many, if not most, psychological disorders” (p. 48). In 2008, a concise overview was published by Greenberg, Solomon, and Arndt, which resulted in the examination of over 350 studies. To summarize the hypotheses and assumptions of TMT the authors explained that the research findings can be divided into five major phenomena:

1. Mortality salience or MS (reminders of death) leads to the positive reactions towards those who share worldviews, and negative reactions towards those who do not share or threaten one’s worldviews.

2. Self-esteem acts as a buffer against anxiety that is triggered by thoughts of death.
3. When one's worldviews or self-esteem are boosted, there is a reduction in worldview defense and self-esteem striving.
4. When self-esteem or worldviews are threatened, one experiences an increase in death-thought accessibility. Boosts to self-esteem and worldviews lead to a decrease in death-thought accessibility.
5. Evidence supporting a literal afterlife reduces the effects that MS has on self-esteem striving and worldview defensiveness.

The significance of these phenomena is such that psychological and sociological behaviors are persistently influenced by terror management. As Landau and Sullivan (2015) succinctly summarized it, "people continually must orient themselves toward maintenance of the anxiety buffer – buttressing the validity of their cultural worldview and living up to culturally derived standards of value- to hold mortality concerns at bay" (p. 211).

The assumptions of TMT include the construct that humans are self-preserving and generally seek to prolong their lives through an array of means. Second, it is assumed that threats to survival would cause a debilitating or paralyzing fear if not appropriately mitigated through coping strategies. And third, coping strategies, including self-esteem striving and worldview defensiveness, among other strategies, are relied upon more when thoughts of death become more salient.

Rationale for TMT as a Framework

One of the reasons TMT was chosen as a framework for this study is simply because of its global relevance. Generally, all humans are subject to thoughts about death and anxiety. It is a constant issue, with reminders occurring frequently. Consequently, it affects many areas of human behavior, health, psychology, and sociology. Second, and importantly, a wealth of empirical, peer-reviewed literature exists, which provides a solid understanding of the inner workings of death anxiety and its related coping and buffering system observed in human behavior. This offers the ability to more accurately predict the effects of MS on human behavior and psyche. Additionally, research design and methods, including tools used for measurements, are discussed in much of the research related to TMT, providing examples of investigations that can be assessed and used for the purposes of this dissertation.

TMT provides a model for understanding the pathways behind the effects of death anxiety. Because of buffering systems that exist, it can be difficult to assess how much death anxiety could potentially affect individuals. However, through an approach of TMT, specific measures can be used to determine not only the effects of death anxiety, but also the impact that a mindfulness strategy has on influencing anxiety, psychology, and behavior. As such, it is an appropriate and relevant model for the specific research questions being explored in this dissertation.

Literature Review Related to Key Variables and/or Concepts

Mortality Salience

MS is the experimental manipulation typically used in studies regarding TMT. Basically, it consists of some sort of manipulation, such as a task or situation where individuals are manipulated to consider their own death. The most common task consists of two questions: (a) “briefly describe the emotions that the thought of your own death arouses in you,” and (b) “write down, as specifically as you can, what you think happens to you when you physically die and once you are physically dead.” The purpose of these questions, or other MS tasks or situations, is to ensure that thoughts of death are more salient in the minds of the research participants.

Other experimental manipulations that are sometimes used in research can be utilized to make mortality salient, but in a way that is less explicit. For example, a study by Jonas et al. (2002) manipulated MS simply by administering a questionnaire either in front of a funeral home, or a few blocks away from the funeral home. The idea was that being closer to a funeral home increases an individual’s thoughts related to death at a subconscious level. They found significant differences in favorability towards charities depending on where the questionnaire was completed. With the exception of a few studies, the majority of research has manipulated MS more explicitly, such as by asking people directly in some way to consider their own death. It is what occurs following a MS manipulation that is usually of interest in research. This technique has been utilized in hundreds of studies over the last three decades.

Affect-Free Claim

Many TMT-related experiments report no noticeable negative change in affect following MS. This notion, referred to as the affect-free claim, is noted implicitly in several papers (Arndt, Allen et al., 2001; Simon et al., 1996), and is assumed in many other investigations. The affect-free claim is a result of a general absence of changes in emotion or anxiety level described by research participants in self-reporting assessments. Martin and van den Bos (2014) highlighted two theories to explain this phenomenon. One theory is that MS causes an unconscious terror, and as such, is not recognized by the participants. A second possible explanation is that only a potential for anxiety rises from MS. This can be quickly addressed through strategies including worldview defensiveness and self-esteem striving. Both of these strategies will be explored further in this chapter.

Martin and van den Bos (2014) critique TMT, asserting that there is a lack of evidence to conclude that MS can produce anxiety or affect mental well-being at all. Lambert et al. (2014) examined 336 published studies that included MS and determined in a meta-analysis that most TMT research did not examine the level of fear of the participants. They then conducted a series of experiments that demonstrated a significant increase in the participants' level of fear immediately following MS and concluded that "the reliable consequences of the MS task for affect can only be seen by focusing specifically on fear" (p. 656).

Further to the studies conducted by Lambert et al. (2014), Juhl and Routledge (2016) claimed that they were able to support empirically that MS does, indeed, cause anxiety and impacts psychological well-being negatively. One of the reasons that they

were able to produce measured results of anxiety caused by MS, while the bulk of the literature has not, is because of the definition of anxiety they used. The study was in fact measuring constructs that could be better defined as well-being. These constructs included *meaning in life*, *nostalgia proneness*, *interdependent self-construal*, and *self-worth*. As such, their research does support that MS impacts psychological well-being negatively, but technically speaking, it did not support an increase in a more common definition of anxiety. Thus, it appears that the effects of MS on affect are not what would be commonly assumed, and consequently are often overlooked in research.

Plausible explanations for the affect-free claim remain a subject of debate, and the consequences of this must be accounted for in research. The apparent lack of measurable changes in affect is why most research within the field of TMT measures constructs such as worldview defensiveness or self-esteem striving to determine an effect, rather than simply anxiety level. Although measures of anxiety or terror resulting from MS continue to be explored in the literature, constructs of increased worldview defensiveness and self-esteem striving are clearly observed phenomenon in response to MS. Therefore, it is critical for the proposed research to focus on these constructs as variables to examine.

Dual Process

It has been observed that the effects of MS are significantly higher when there is a delay after the exposure leading to death-related thought. Burke et al. (2010) reported that there is a linear relationship in comparing studies that include either no delay, one delay task, two delay tasks, or three delay tasks. This relationship is such that the more delays that are used, the higher the effect size of MS. A similar relationship was found in the

length of delay, with a longer delay causing a higher effect size. The authors concluded that when mortality is present in the conscious mind, there must be some buffering that occurs. However, the more removed from the conscious mind that mortality is, while still accessible in subconscious thoughts, the higher the effect it has.

TMT supporters have proposed that there are proximal and distal defenses that buffer against death anxiety after one is exposed to death-related thoughts. In a recent study by Abeyta et al. (2014), there was no measured increase in death anxiety in the population studied immediately after being primed by MS (i.e., proximally). However, distally (i.e., after a period of delay) increases in death anxiety were observed, but only in those who scored low in levels of self-esteem. In this study, 91 undergraduate students were exposed to either a MS or pain salience manipulation. Following the manipulation, the participants were either asked to complete a death-anxiety questionnaire immediately after, or they were given a simple task as a distraction first and then asked to complete a death-anxiety questionnaire to measure their fear of death. Based on these findings, the authors concluded that anxiety towards death is well managed immediately after thoughts of death occur, but after a period of time anxiety increases. The authors suggested two explanations for this phenomenon. First, it is possible that immediately following MS people underreport their true level of death anxiety in order to suppress or deny thoughts about death. Second, it is possible that the proximal defenses put in to play, (including the denial of death) provide only a temporary defense.

A third possibility not explored by Abeyta et al. (2014) is that people may continue to experience some form of awareness or cognitions of death that increase

anxiety with time. Future research could evaluate the relationship between death anxiety and time as a continuous measure, rather than a dichotomy. But what does remain clear, is that there is an increase between length of time passing after a MS technique and effect size on death anxiety.

As a result of the dual process phenomenon observed, it is important to include a delay after a MS manipulation to increase probability of an effect in the participants. This is often done in experiments by including a questionnaire, video, or activity that stands as a time-buffer, and otherwise is not expected to affect the results of the experiment at all. These activities include a short personality test, educational video, or mathematical activity such as counting in reverse by seven.

Worldview Defensiveness

As described by Pyszczynski et al. (2004) worldviews are “constructed shared symbolic conceptions of reality that give meaning, order, and permanence to existence; provide a set of standards for what is valuable; and promise some form of either literal or symbolic immortality to those who believe in the cultural worldview and live up to its standards of value” (p. 436). Worldviews offer a buffering system against existential anxiety. When primed by reminders of mortality individuals become more defensive of their own worldviews and ally more closely with those who share their worldviews, and conversely become less tolerant of other opposing worldviews and those who share opposing ideologies (Burke et al., 2010). In TMT, worldview defensiveness describes the measures taken to secure or justify worldviews when they are perceived to be challenged.

Worldviews are overtly established and taught in religions. As such, according to TMT religiosity should increase, and individuals will adhere more strongly to their religious beliefs, as they face death-related thoughts. To test this hypothesis a study was performed by Du and Chi (2016) which compared data from the World Values Survey Wave 6 (2010-2014) consisting of 82,722 respondents from 57 countries or districts throughout the world. The survey included questions about worries about war (such as “To what degree are you worried about the following situations?”), religious practice (such as “Apart from weddings and funerals, about how often do you attend religious services these days?”), and belief in God (such as “Do you believe in God?”).

The responses of the participants were correlated to the Global Peace Index (GPI) for the country of the respondent. GPI, published by the Institute for Economics & Peace, is a measure of the state of peace in a nation. This was made up of 3 categories including ongoing domestic and international conflict, safety and security in society, and militarization. A statistical regression was run to determine the relationship between war and religiousness, and then to analyze worries as a potential mediator.

The research found a positive association between religiousness (as indicated by religious practice, religious identity, and belief in God) and the GPI coefficient. They also discovered, as predicted, that worries about war were positively correlated with GPI. Using a Monte Carlo analysis, they found that “the indirect effects of GPI coefficient on religious practice (95% CI [0.015, 0.059]), religious identity (95% CI [0.02, 0.084]), and belief in God (95% CI [0.027, 0.109]) via worries were all significant” (Du & Chi, 2016,

p.447-448). This demonstrates a significant correlation; however, further research was needed to establish a causal relationship.

One possible explanation for the measured correlation is that religious fundamentalists may be more likely to wage war. To better understand this correlation, the researchers divided indicators of the GPI into two groups; indicators that are religion related (e.g., ongoing conflict, and security in society), and indicators that are not religion related (e.g., militarization). Because they found a significant relationship between religiousness and all three indicators across both groups, they concluded that the influences of religion on war cannot completely explain the link between GPI and religiousness. The other remaining probable explanation is the notion of TMT that significant reminders of death caused by war lead to an increase in worldview defensiveness, as measured by religiosity. The conclusions of the research performed by Du and Chi (2016) support TMT.

TMT and Self-Esteem

According to TMT, self-esteem provides an important role in buffering against death anxiety. This relation is observed in a few distinct ways. First, following a short delay after having been primed by thoughts of death, an increase in death anxiety can be observed, but only among those with low self-esteem. Those with high self-esteem do not report an increase in death anxiety (Abeyta et al., 2014). Also, of interest is that researchers did not find any increase in death anxiety immediately after the MS task.

A second way that self-esteem is shown to be related to terror management was studied by Wisman et al. (2015) who compared responses of those with high self-esteem

to those with low self-esteem after being primed by thoughts of death. They found that those who are low in self-esteem are less self-activating, will drink more alcohol at a nightclub, and will focus on others more than on themselves when primed by thoughts of death. In summary, the authors suggested that “self-related cognition is relatively more aversive when mortality was salient for people low in self-esteem” (p. 128). They believe that those low in self-esteem lack the ability to bolster themselves, and therefore, have a greater motivation to escape from self-awareness when conscious of mortality. Others have suggested that those low in implicit self-esteem struggle to manage death-related anxiety because they are less able to access a positive framework of themselves (Yang et al., 2012).

In addition to the research that supports the theory that those high in self-esteem are more immune to the negative effects of MS, a third area emerges that correlates self-esteem with terror management. There is supporting evidence that individuals strive to bolster their self-esteem in order to mitigate these negative effects. Dechesne et al. (2003) found that when primed by death thoughts, research participants not only became more defensive of their worldviews, but also strived to bolster their self-esteem by rating positive personality traits as more accurately describing themselves. It may be that because of the mitigating effects that self-esteem has over death anxiety, when primed by thoughts of death individuals will strive to bolster their self-esteem in an effort to manage terror.

In recent years neuroscience has shed additional light on the brain functions related to self-esteem and terror management. The research of Klackl et al. (2014), using

fMRI, analyzed the brain activity of participants as they were exposed to a visual prompt of written sentences from each of three categories, death-related, unpleasant, and neutral. First, they were able to map the areas of the brain that responded to death-related sentences over the neutral or unpleasant sentences. Next, they compared the brain activity of different levels of self-esteem. They were then able to determine a pattern, “that high self-esteem individuals deactivated the right anterior insula more strongly during death-related sentence reading” (p. 1759). They also observed that among those low in self-esteem, when exposed to death-related sentences compared with unpleasant sentences, there was more activation in certain areas of the pre-frontal cortex that are associated with emotion regulation. The authors speculate that those low in self-esteem were required to recruit more resources to buffer against death anxiety. Additionally, they reported that of certain areas of interest, only the right caudate nucleus was able to differentiate between the three sentence groups.

Interestingly, the right anterior insula, is associated with self-awareness. Thus, Klackl et al. (2014) suggested that those high in self-esteem may buffer against existential anxiety by lowering or de-activating awareness of oneself. Additionally, those low in self-esteem rely more heavily on regulation of emotions evoked from MS. In spite of the difficulties of extrapolating neuroscience data into emotional responses, it does remain of certain significance that patterns were observed, providing empirical support for TMT.

Prior to Klackl et al. (2014), a similar study carried out by Quirin et al. (2011) examined the differences in brain activity among individuals when required to respond to

questions about either dental pain or death by pressing a button to respond “yes” or “no” to the statements. Their investigation identified three areas of the brain that were associated with responses to mortality threats including the right amygdala, anterior cingulate cortex (ACC), and right caudate nucleus.

Klackl et al. (2014) observed changes in the right caudate nucleus as was published by Quirin et al. (2011) However, changes in the right amygdala and anterior cingulate cortex (ACC) were not observed. Some of the suggested possibilities for this were that Klackl et al. used statements in the third person, and Quirin et al. used statement in the first person, which may be a source of discrepancy considering the important role that self-awareness is believed to have in TMT.

The implications of neuroscience for TMT are that first, it adds credence to the theory, and demonstrates empirically the changes that take place following MS. Second, neuroscience helps to understand the mechanisms behind terror management. Specifically, self-awareness can be de-activated by those high in self-esteem as a way to buffer against existential anxiety, while those low in self-esteem require other resources to buffer against existential anxiety. As such, in this research project it is important to have participants involved in activities that encourage self-awareness, since that has shown to affect participants more so than instances where they are considering the mortality of others. When challenged to consider their own mortality, participants will likely require more coping strategies.

Clinical Applications of TMT

Terror management theorists believe that the pursuit of meaning, personal value and interpersonal connections which affect human behavior are motivated by the desire to manage death-related anxiety. As such, clinical issues including anxiety disorders, PTSD, and depression may all have roles in terror management. Maxfield et al. (2014) theorized that terror management plays a considerable role in psychosocial functioning. They suggest that existential anxiety should thus be implicated in therapeutic interventions.

DeWall and Baumeister (2007) demonstrated through three experiments that positive thought accessibility increased in subjects as they were primed with MS. This may seem counterintuitive at face value, but research supports that it does happen at a subconscious level. It is possible that because the fear of death could be so debilitating, that humans has evolved a way to mitigate this anxiety alongside the development of the understanding of the inevitability of death. Further research done by Hirschmüller et al. (2016) explored the final words of 407 death row inmates immediately before their executions and found “a significantly higher proportion of positive to negative emotion words” (p. 1).

Lewis (2014) presents the idea of utilizing TMT and existential psychotherapy together to form a unique psychotherapeutic modality. Although it has not as of yet been researched empirically, the theory is based on the idea that MS provides an opportunity to assess a client’s concerns with death (anxiety) as well as their coping strategies utilized through the anxiety buffer system. The client would then be exposed to MS, and as such, would theoretically experience an increase in anxiety. This anxiety would then be

mitigated by a few avenues. The first will occur naturally, as has been evidenced by DeWall and Baumeister (2007), because MS increases individuals' accessibility of positive emotion. It is possible that one's own natural, instinctive coping strategies begin in an attempt to mitigate anxiety. The second method to mitigate anxiety will be performed explicitly using existential therapeutic techniques, specifically, helping the client to create meaning from their anxiety by confronting death.

Although this research paper is not directly investigating the clinical value of terror management strategies, it does help to pave the way for future researchers to better understand its possible implications. As the science of existential anxiety and its relation to mindfulness are better understood, our ability to develop practical approaches to issues including the aforementioned mental health issues including not only death anxiety, but possibly other forms of anxiety disorders, PTSD, and depression will be enhanced. In turn, this will offer a path to creating positive social change.

Terrorism Salience

Dewa et al. (2014) tested to see if being primed by thoughts of terrorism, rather than simply mortality, would cause similar effects as those seen among individuals primed by thoughts of mortality. In their experiment participants were placed in either a terrorism salience (TS) group where they were asked questions about the terrorist attacks on 11 September 2001, a MS group where they were asked similar questions, but about mortality rather than terrorism, or a control group where they were asked about television. The results showed that those in the TS group did not experience the same increases in anxiety as those in the MS group. In fact, the TS group showed decreases in

anxiety level, though the decreases did not reach statistical significance. This suggests that the theory of TMT does not generalize from MS to TS. These observations are similar to those commonly seen in TMT related research where control groups include a pain salience task (commonly dental pain) because increases in worldview defensiveness and self-esteem striving are not observed, which adds to the uniqueness of terror management.

Mindfulness

Mindfulness is a term that has been used in the scientific literature in distinctive ways. This is in part due to the fact that mindfulness is at times described as either a trait, a state, or a practice. To clarify the differences between these three, the following definitions are given for each. As a state, mindfulness is “a kind of non-elaborative, nonjudgmental, present-centered awareness in which each thought, feeling, or sensation that arises in the attentional field is acknowledged and accepted as it is” (Bishop et al., 2004, p. 232). When describing a trait, mindfulness can be defined as “a quality of consciousness manifest in, but not isomorphic with, the activities through which it is enhanced” (Brown et al., 2007). And lastly, as a practice mindfulness is “paying attention in a particular way: on purpose, in the present moment, and nonjudgmentally” (Kabat-Zinn, 1994, p.4).

For the purposes of this work, mindfulness practices will be clearly identified as such. There are several interventions that center on the practice of mindfulness. Some of the more common interventions include: Mindfulness-Based Stress Reduction (MBSR), Mindfulness-Based Cognitive Therapy (MBCT), Dialectical Behavioral Therapy (DBT),

and Acceptance and Commitment Therapy (ACT). These fall under the umbrella of Mindfulness Based Interventions (MBIs).

Although what is described today in the western world as mindfulness is now catching the attention of the scientific and clinical communities, it is by no means a new concept. It bares roots in Buddhism, which is at least 2550 years old. However, from the process of being *westernized*, it has been taken from a spiritual context as part of a way of life, where one is to reflect on spiritual teachings of the Buddha and simplified to an exercise which for the most part, is void of any overtly spiritual or religious context (Keng et al., 2011).

During the 1950's and 1960's there was a movement in Western cultures that placed emphasis on Zen Buddhism with can be observed in the work of novelist, Nancy Wilson Ross, *The World of Zen: An East-West Anthology* (1964). Zen meditation differed from the other meditations being practiced at the time. "Zen meditation involves calmly attending to the flow of all stimuli, not a continuous single stimulus. One does so without thought, judgment, or analysis" (Smith, 2005, p. 17-18). Other forms of meditation that were popular at the time, such as transcendental meditation, were found to have significant effects on physiological arousal (Wallace, 1970), and brainwave activity (Kasamatsu et al., 1966), and these findings helped to fuel the progress of meditation research in general, and mindfulness in particular.

In the 1970s mindfulness programs became popular in clinical settings (Keng et al., 2011), largely due to the work of Kabat-Zinn who initiated a program as a chronic pain intervention in 1982. It continued to grow as a tool which clinicians used for the

next 20 years, in spite of the lack of empirical investigation (Bishop et al., 2004).

However, since Bishop et al. pointed out the paucity of research done on mindfulness at the time, there has been an exponential increase in the amount of research that has been carried out on mindfulness.

The Five Facets of Mindfulness

To facilitate empirical research and the mechanisms behind mindfulness as a state, trait, or practice, some researchers have broken it down into five facets (Baer et al., 2006). Those facets include acting with awareness, observing, describing, non-reacting, and non-judging. Raphiphatthana et al. (2016) suggested that teaching specific aspects of mindfulness therapies that are associated with improvements in anxiety and depression could be beneficial. In order to do this, there needs to be a better understanding of the relationship of each of these facets to each other, and to anxiety and depression. This understanding is of key interest and benefit to the current study regarding the relationship between mindfulness and death anxiety.

Although there exists a large amount of research that supports the effectiveness of mindfulness-based treatments on psychological disorders including depression and anxiety (Evans et al., 2008; Hofmann et al., 2010) the majority of the research has not investigated which of the five facets of mindfulness appear to be responsible for the observed outcomes. However, in 2013 one study conducted by Desrosiers et al. examined the relationship between the five facets of mindfulness and the psychological symptoms of depression and anxiety. In their study 187 participants of a clinical population were asked to fill out the Five Facet Mindfulness Questionnaire (FFMQ) and the Mood and

Anxiety Symptom Questionnaire. Their analysis identified a significant and inverse correlation between general distress anxiety and non-reactivity and non-judging. Anxious arousal was positively associated with observing, and negatively associated with describing.

Similar results were found by Brown et al. (2015) who also reported a negative association between anxiety and both non-reactivity and non-judging. In addition, they found the facet of observing to be positively associated with stress. Their research also found observing to be the only facet not significantly correlated with anxiety symptoms, and positively correlated with higher levels of stress. Continued research on the five facets of mindfulness, along with both their individual and combined effects on mood disorders may prove valuable in the development of clinical strategies.

An examination of the separate facets of mindfulness is imperative in the expanding of our understanding of the mechanisms underlying mindfulness. This understanding will in turn help in the development of mindfulness traits. Research on twins has found that trait mindfulness is 32% due to heritable factors and 66% due to nonshared environmental factors. (Waszczuk et al., 2015). This demonstrates that there are likely both genetic and external factors affecting the mindfulness of individuals. With a better understanding of the specific facets that may affect development of trait mindfulness, those specific facets could be implemented to promote, develop, and improve it.

Key Constructs of Mindfulness

While research into the five facets of mindfulness may be in its early stages, many definitions of mindfulness look at two key constructs which are namely (a) awareness and (b) acceptance. Cardaciotto et al. (2008) clarify these in more detail to be “(a) the behavior that is conducted” and “(b) how that behavior is conducted” (p. 205). The first construct of awareness deals with the focus or monitoring of experience in the current moment, rather than thoughts or worries about past or future events (Roemer & Orsillo, 2003). The ability to be aware and focus is a naturally powerful resource for humans, and as such the goal for many meditators is to be able to harness the skill of attending to a specific thought or emotion and learn to redirect or regulate that thought to a single concept (Brown & Ryan, 2004).

Acceptance can be defined as “experiencing events fully and without defense, as they are” (Hayes, 1994, p. 30). Kabat-Zinn (1990) expresses the concepts of “lovingkindness” as well as non-striving and gratitude, which can clearly correlate with the construct of acceptance. The idea of letting go of judgments and allowing, without an effort to change or separate oneself from the experience allows for the decrease or avoidance of distress and could be seen as a tool used in emotional regulation.

Mindfulness and Anxiety

There does exist much research on the relationship between mindfulness and anxiety. In 2013 the Centre for Reviews and Dissemination released a meta-analysis they performed on mindfulness-based therapy (Khoury et al., 2013). Their research included 209 studies with 12,145 participants. The authors of this review concluded that

“mindfulness-based therapy was moderately to largely effective for a variety of psychological problems, especially for reducing anxiety, depression and stress.”

Mizera et al. (2016) suggested that the effectiveness of Mindfulness Based Interventions (MBIs) on anxiety may be due to several factors: (a) the act of focusing on the anxiety, without attempting to change it could be a possible form of exposure therapy; (b) by managing the reactivity to anxious thoughts, one is better able to implement other strategies to mitigate against said anxiety due to being in a clearer mental space. Excessive worry and difficulty with emotional regulation leads to a high focus on future, past, or distant events, which occupy mental, cognitive, and physiological resources, leaving limited resources for coping with more current and pressing needs; (c) a state of relaxation often occurs as a result of mindfulness-based interventions; (d) by accepting and not attempting to control the symptoms of anxiety, the intensity of anxiety can lessen.

Mindfulness, Forgiving and Trust

As individuals ponder their own mortality, they tend to display more negative reactions towards others that transgress the worldviews or morals that they adhere to, such as prostitutes. Rosenblatt et al.'s (1989) research supports the notion of being less forgiving or understanding of others for straying from worldviews including a moral compass. Mindfulness was found to be positively correlated with forgiveness (Webb et al, 2012). Also, an 8-week mindfulness program has shown to increase forgiveness among college students (Oman et al., 2008). It is possible that TMT can provide insight on the mechanisms behind this forgiveness. If mindfulness is able to decrease death

anxiety, and thus cause less need for worldview defensiveness, it would then be easier to forgive.

Similarly, trusting in others of a different race can also be impacted by mindfulness meditation. Lueke and Gibson (2016) carried out research in which participants were randomized to either a 10-minute audio mindfulness meditation, or a 10-minute description of an English countryside. They were then asked to participate in a “trust” game that included hypothetically lending \$0-10 of money to individuals that would then receive four times the amount the participant would give to them. The participants in the research were shown pictures of 150 faces and told that these individuals had already decided previously whether they would keep all of the money given to them or take half and give the other half to the research participant. The goal of the participants was to end up with the most amount of money possible. The participants in the control group showed a bias to “trust” their funds with white individuals. However, those in the mindfulness group “trusted” white and black individuals evenly. This lends support to the idea that mindfulness meditations may buffer against the impact of death anxiety, and the effects resulting from MS as proposed by TMT.

Mindfulness and Self-Esteem

There exists an observable relationship between mindfulness and self-esteem, which “can be attributed to the fact that higher mindfulness makes an individual less engrossed by negative feelings and thoughts that represent low self-esteem” (Bajaj, Gupta, & Pande, 2016, p. 96). In their correlational analysis Bajaj, Gupta, and Pande found that self-esteem fully mediated the relationship between mindfulness and positive

affect, and partially mediated the relationship between mindfulness and negative affect.

In a separate study, self-esteem was also found to be a mediator between mindfulness, anxiety, and depression (Bajaj, Robins, & Pande, 2016). These studies offer insight into the possible linkages between mindfulness and a buffered reaction to MS.

Effects of Mindfulness on Defensiveness and Aggression

In an effort to better understand the relationship between mindfulness and defensiveness Lakey et al. (2008) examined the verbal defensiveness of research participants over a period of a few weeks. They found that those with higher mindfulness scores (as per the Mindful Attention Awareness Scale; MAAS) engaged less in verbal defensiveness. However, their research did not provide a causal ordering of mindfulness and defensiveness.

Further research investigated not only correlation, but also causality. Heppner et al. (2008) conducted a pair of studies on mindfulness and aggressive behaviors. The first study demonstrated that the research participants who rated higher in dispositional mindfulness reported less aggressiveness and hostile attribution bias. Their second study included augmenting mindfulness through what they termed a “mindfulness induction task.” Participants were then given social rejection feedback. Those who were involved in the mindfulness induction task were later rated to have lower levels of aggression. These findings suggest that both state and trait mindfulness may lead to lower defensiveness and aggression.

Mindfulness and Death Anxiety

Only in the last few years has the relationship between mindfulness and death anxiety been receiving attention. The studies that are now being published demonstrate an inverse relationship between mindfulness and death anxiety. For example, a study performed on 100 men aged 65 to 75 found that mindfulness and sense of humor predicted a reduction of death anxiety (Hosseinzadeh & Khodabakhshi-koolaei, 2017). Park and Pyszczynski (2017) reported that even one experience of mindfulness meditation eliminated worldview defensiveness shown among those subjected to MS.

A series of correlational studies considered how mindfulness relates to self-esteem striving and worldview defensiveness including patriotism, racism, and social values/transgressions (Niemi et al., 2010). The research determined that those higher in trait mindfulness are less defensive of their worldviews when mortality is salient. Furthermore, those high in trait mindfulness did not react defensively when worldviews associated with mindfulness were attacked. The authors concluded that the results were not due to separate worldviews held by those high in trait mindfulness. As such, it is more likely that worldview defensiveness when mortality is salient is attenuated by trait mindfulness.

Summary and Transition

Through this review of the literature on TMT it is evident that MS increases worldview defense and self-esteem striving. Although the underlying psychological mechanisms are not completely understood, anxiety appears to play a major role in this system. What is also evident through this literature review is that mindfulness contributes

to the interplay of constructs including anxiety, self-esteem, and defensiveness. The low number of mindfulness studies applying TMT as a framework is surprising, considering the depth and span of research in both the fields of TMT and mindfulness. This study is one of the first to do so, possibly pioneering the way for future research, theorizing, and development of clinical interventions. Through these avenues it can effect positive social change.

The following chapter will include a detailed process of how the connection between mindfulness and death anxiety was studied. Similar to much research already published on the topic, a quantitative approach in an experimental study will be utilized. Manipulating the variable of MS, by asking participants to consider and describe thoughts of death and dying was used as a way to initiate changes in their cognitive processes. These changes, including worldview defensiveness were measured and compared to the levels of mindfulness and self-esteem of each participant.

Chapter 3: Research Method

In the literature review, TMT was described in detail, including MS and its relationship with anxiety, self-esteem, and worldview defensiveness. In addition, the effects that mindfulness has on anxiety were highlighted. A significant gap in the literature has been identified that examines the role of mindfulness in TMT. The purpose of this study was to fill this gap in part, by examining the correlation between mindfulness and worldview defensiveness when mortality is made salient. This was examined through the lens of TMT. This chapter outlines the design and methods used to carry out this investigation. It describes the research design; the methodology, which includes a description of the sample population, the instrumentation to be utilized, and an outline of the data analysis procedures; an exploration of the threats to validity; and a detailing of ethical procedures observed.

Research Design

This study was correlational and quantitative in nature. The independent variable in question was mindfulness. The dependent variable of interest was worldview defensiveness. Self-esteem was examined as a covariate along with gender and age. The dependent variable of worldview defensiveness has been included rather than strictly observing death anxiety because the literature has repeatedly demonstrated that death anxiety is buffered through natural coping strategies. TMT explains that said buffering leads to worldview defensiveness, which was measured. Although some have disputed the theory of terror management suggesting that death anxiety may increase under conditions where mortality is salient (Leary & Schreindorfer, 1997), the majority of the

literature supports the theory that worldview defensiveness is a good measure of the effects of mortality being made salient.

The investigation that was carried out involved questionnaires to measure the variables of interest, and a simple MS exercise followed by two delay tasks. The MS exercise is a task to force people to think about their own death. The purpose of delay tasks will be explained in more detail in this chapter. This research was limited by the number of participants involved, due to the time and cost of acquiring participants. The use of a quantitative research design was appropriate for this study given the experimental nature of the design and need to measure the studied variables. Further, the majority of TMT research has followed a quantitative design (Goldenberg & Arndt, 2008).

Methodology

Population

Participants were recruited using Amazon Mechanical Turk (<https://www.mturk.com>), a platform designed to help with acquiring participants for such things as the collection of data for research purposes in order to achieve the appropriate number of participants in a reasonable time frame. Participants were required to be fluent in English. For this research, it was important that the participants identify as being U.S. Americans because the worldview defensiveness task is developed around pro-U.S. American versus anti-U.S. American essays. Participation was restricted to individuals aged 18 years or older for purposes of consent in consideration of the fact that research would include a MS task, which holds a potential for increasing discomfort. No

other criteria were necessary to be met other than fluency in English, being at least 18 years old, and identifying as U.S. American. With so few criteria for the accessible population for this study, the sample was decided upon by availability through the used recruiting platform out of convenience.

An a priori F test power analysis was completed using G*Power 3.1 (Erdfelder et al., 1996) using an effect size estimated from literature (Niemic et al., 2010). G*Power is a software tool used to produce power analyses on common statistical tests in behavioral research. The data for input used was as follows: $f^2 = 0.15$, power = 0.80, $\alpha = 0.05$, number of predictors = 4. The data output was as follows: Critical $F = 2.49$, $df = 4$, 80, sample size = 85. As such, a minimum of 85 participants needed to be recruited.

Other than self-identifying as being a U.S. citizen, it is not of interest what race or subculture the participants belong to. Demographic information was limited to age, sex, whether or not they identify as U.S. Americans, and fluency in English. Participants were allowed to withdraw from the study at any time, with no questions asked, by simply not fully completing any of the tasks. They were also informed prior to, and throughout their participation, that participation is completely voluntary.

Procedures

Participants were able to participate completely during a single time block at a computer with Internet access. After reading a consent form, they were able to opt in to participate by entering their age and gender, declaring their fluency in English and self-identifying as U.S. American. They would then continue with the tasks involved in the research. All tasks were carried out on the computer, and data were collected and saved

electronically. Each participant was asked to complete six tasks in total. These tasks, in the order that they were presented to participants, are (a) the RSES, (b) Philadelphia Mindfulness Scale (PHLMS), (c) Mortality Attitudes Personality Survey (MAPS), (d) a word search puzzle (see Appendix A), (e) the Positive and Negative Affect Schedule (PANAS), and (f) a worldview defense assessment. Each of these will be discussed more in detail below. Upon completion of these tasks, there was no need to follow up with the participants. Furthermore, there was no way to follow up since no identifying information was collected.

To summarize the purpose of each task, the RSES is to measure a covariate. The PHLMS is to measure the independent variable. The MAPS is utilized as a way to induce MS. This was used to manipulate the independent variable (MS). That is, the participants state awareness of mortality was increased by being asked to describe in detail thoughts of their own death. The word search puzzle and the PANAS were used only as delay tasks. As such the data collected is of no use to the analysis, but the tasks were included to cause a disruption of cognitive processes. Finally, the worldview defense assessment was used to measure the dependent variable.

Recruitment Procedures

Participants were recruited using the Amazon Mechanical Turk platform. I posted a link to the survey on that website for a group of survey-takers matching the criteria of being at least 18 years of age and living the United States of America. Those who agreed to participate were able to follow a link to the survey on the SurveyMonkey platform (<https://www.surveymonkey.com>). I then downloaded the responses and saved them on

an encrypted and password-protected USB drive kept in a locked room. Only data from participants who completed the survey in full were included in the final calculations. As such, anyone who did not wish to complete any part of the survey is effectively withdrawing themselves completely. Informed consent was provided by the participants through completion of the survey in full. Prior to beginning the survey, participants were provided a document explaining the process in detail including information regarding confidentiality, and how their data was to be used. Immediately upon completion, they were thanked for their time. No further follow-up occurred.

Instrumentation

RSES

Considering the wealth of research that has established a clear link between MS, self-esteem, and worldview defensiveness in TMT (Burke et al., 2010; Harmon-Jones et al., 1997) as well as the researched link between self-esteem and mindfulness (Bajaj, Gupta, & Pande, 2016), self-esteem was included in this research project as a covariate. A commonly used scale for measuring self-esteem is the RSES (Rosenberg, 1965), which is considered to be valid and reliable (Blascovich & Tomaka, 1993). It is published for use without explicit permission and at no charge for professional research (University of Maryland, 2020).

The RSES consists of 10 items that are assessed on a Likert-type scale that ranges from *strongly agree* to *strongly disagree*. Half of the statements are positively worded, whereas the other half are negatively worded. Scoring occurs on a scale from 0–30 with a higher score signifying a higher self-esteem. It was developed on a cohort of 5,024

adolescents from schools in New York State (Rosenberg, 1965). The coefficient alpha for the RSES ranges from 0.72 to 0.92, and the internal consistency is 0.89 (Grilo et al., 2005). The RSES is available for use in professional research without cost or permissions required.

PHLMS

The PHLMS is a 20-item self-report measure that provides two subscales: Awareness and Acceptance. More specifically, it was designed to measure present-moment awareness and acceptance. Awareness is the act of paying attention to the present moment. Acceptance is the method of awareness, achieved through a nonjudgmental stance toward experiences. The two subscales can be added to provide a total mindfulness score. Participants are required to respond on a scale of 1 (*never*) to 5 (*very often*) on each statement. Thus, higher scores represented a higher level of mindfulness. One advantage of the PHLMS is that it was developed to include populations that do not have meditation experience (Cardaciotto et al., 2008), which suits the purposes of this research well. Reliability studies have found an internal consistency yielding a Cronbach's alpha of .81 for the Awareness subscale and .85 for the Acceptance subscale (Cardaciotto et al., 2008).

Limitations of PHLMS to be noted are, first, that only reverse-scored items are included in the Acceptance subscale. This occurred after assessing statements that included those that were also direct scored. The experts found that only the reverse-scored items produced acceptable internal consistency. Interestingly, in the development of the Mindful Attention Awareness Scale (MAAS) similar limitations were found and it,

too, only includes reverse-scored items (Brown & Ryan, 2003). The Kentucky Inventory of Mindfulness Skills only includes reverse-scored items for one of their subscales as well (Baer et al., 2006). A second limitation presented by Cardaciotto et al. (2008) is that the PHLMS was developed using a student population, and the studies used with clinical populations consisted of small sample sizes. However, for the purposes of this research, a nonclinical population was used.

Mortality Salience Induction

Previous TMT research that does not include populations that are already being exposed to thoughts of death, such as prison inmates on death row (Hirschmüller & Egloff, 2016) has needed to employ MS inductions to increase thoughts of one's own death. Some have relied on subliminal death reminders such as conducting interviews outside of a funeral home (Jonas et al., 2002) or near a cemetery (Gailliot et al., 2008), but more commonly questionnaires are used (Quirin et al., 2012; Rosenblatt et al., 1989). One very common method questionnaire for inducing thoughts of mortality is the MAPS (Greenberg et al., 1990).

The MAPS consists of two open-ended questions that carry the purpose of challenging the participants to think and write about their own death. Although the participants were required to respond in detail, their responses are not particularly useful for research purposes and as such, were not analyzed (Rosenblatt et al., 1989). The questions only serve to induce MS. Some variations of the MAPS have been used in past studies, such as by Landau et al. (2004). In this investigation, the researchers were particularly interested in the 9/11 terrorist attacks and how death reminders associated

with them related to support of a political leader, and so they adapted the questions to reflect the terrorist attacks specifically.

For the purpose of this research, the original, unaltered questions were utilized because there was no need to adapt them. Second, in a meta-analysis on TMT research, Burke et al. (2010) found that, of 277 experiments, 79.8% used the MAPS, and produced a robust effect of $r = .35$, placing it in the 80th percentile for theories in personality and social psychology.

Delay Tasks

Implementing a delay after the MS induction and before measurement of the dependent variable has been utilized in much TMT research (Burke et al., 2010; Steinman & Updegraff, 2015). Steinman and Updegraff reported that implementing a delay task, and task-switching during the delay led to increased effect sizes and theorized that this is a result of the dual-process model. The dual-process model argues that following MS there is an immediate suppression of death-thought accessibility, and after a delay there is a decrease in the suppression, which leads to an increase in death-thought accessibility.

In an analysis of the effects of delay tasks in TMT research, Burke et al. (2010) discovered that experiments with two or three delay tasks yielded significantly larger effect sizes, $r(58) = .41$ and $r(6) = .47$, respectively, over those with one delay task, $r(177) = .33$, or no delay task, $r(18) = .30$. Furthermore, shorter delay tasks including tasks of estimated 2–6 minutes show smaller effects, $r(188) = .33$, than longer delays of

estimated 7–20 minutes $r(54) = .41$. As such, it is apparent that longer and more delay tasks increase the effects of MS.

Common delay tasks in TMT research include an affect scale, a reading passage, or a puzzle. This study implemented both an affect scale and a word search puzzle that is commonly used. The word search puzzle (see Appendix A) consists of short instructions that indicate this is a break between essays and quizzes. It presents a series of 12 words, and a word puzzle. Beneath the word puzzle it asks, “how many words were you able to find?”

The PANAS was used as an additional delay task. This is a commonly used test in TMT research. Although it does not explicitly mention death, it is important to note that there are some words, such as “hostile,” or “afraid” that may possibly correlate with death-thought accessibility for some participants as noted by Steinman and Updegraff (2015, p. 1692). The PANAS is available for nonprofit research purposes without explicit permission (ePROVIDE, 2019).

Worldview Defense Assessment

When primed by thoughts of death, individuals tend to adhere more to their personal worldviews and become less tolerant of worldviews that oppose their own (Greenberg et al., 1990; Harmon-Jones et al., 1997; Landau et al., 2004). The uniqueness of individual worldviews poses a threat to validity of worldview defense measures. Identifying each individual’s personal worldviews, and then measuring defensiveness of their specific worldviews would prove to be a difficult process. One method to overcome this threat to validity is done by limiting research to specific populations where it is

reasonably believed that worldviews will be consistent between participants. For example, some research has focused on populations within a specific religious group (Greenberg et al., 1990). Another method used is implementing a test that measures common worldviews within the cultural setting that it is being implemented. Some researchers have measured this by observing how participants react to vignettes about those who transgress social norms. An example of this is found in the Multidimensional Social Transgression Scale (MSTS) used by Florian and Mikulincer (1997). This scale specifically asks participants to judge according to Israeli law, and as such, would have been less valid in the setting for the research of this thesis.

Another common practice to assess worldview defensiveness that has been widely used in research within the field of TMT is to ask participants to rate a series of essays that display the country of the participants in a positive and/or a negative tone. They are then asked to rate the essays on a number of criteria, or rate how true the essay is, or how much they agree with what is written. One example of this is used by Hart et al. (2005), where they use an anti-United Kingdom essay and compared responses to a pro-United Kingdom essay.

Lastly, a more commonly used tool was initially prepared and utilized by Greenberg et al. (1992). In this worldview defense assessment tool (see Appendix B), participants were asked to assess their “gut level reactions to essays about America and Americans” (Hart et al., 2005, p. 1003). These two essays ostensibly written by foreign students strongly hold opposing views, one praising and the other criticizing America and Americans. The first essay includes discussion of positive values found in America

including freedom, democracy, and opportunity, whereas the second essay includes discussion of negative points including laziness, greed, and arrogance. Participants are then asked to rate on a scale of 1–9 (1 = *not at all*, 9 = *totally*) five questions that address such things as how much they like the author, how much they agree with what was written, and how true they believe the statements written are. For consistency, none of the five questions are written in reverse fashion so that a higher score always indicates a more positive view of the essay and its author. This method has been used as a measure for worldview defense by many others in scholarly research over the last few decades (Beck, 2006; Harmon-Jones et al., 1997; Hart et al., 2005).

The worldview defensiveness was calculated following the standard procedures used in previous TMT research, such as done by (Harmon-Jones et al., 1997; Simon et al., 1996). Specifically, for each evaluation, the total score of the responses to the anti-U.S. essay will be subtracted from the total score of the responses to the pro-U.S. essay. An analysis of the reliability of calculating worldview defense in this fashion was conducted by Simon et al. (1996). Through conducting a principal components factor analysis with varimax rotation they found high reliability (Cronbach's alpha = .92).

Data Analysis Plan

Considering the literature that currently exists and has been reviewed in Chapter 2, it was hypothesized that there would be a significant relationship found between mindfulness and worldview defensiveness when mortality is made salient and followed by a delay. Specifically, the questions to be answered, as detailed in Chapter 1 are identified below with null and alternate hypotheses.

Covariates

Three covariates were included in the data analysis. First, age was included since research has demonstrated that responses to MS can vary as a function of age. For example, a harsher judgment of moral transgressions is seen in younger adults when compared to older adults (Florian & Mikulincer, 1997; Rosenblatt et al., 1989). Maxfield et al. (2007) conclude that there are different coping strategies used in separate age groups when mortality is salient.

Second, self-reported sex was included. Research suggests that men and women may fear death differently, with women tending to fear death more than men (Russac et al., 2007). Although not routinely employed as a variable in TMT research, some research has suggested a possible effect that it may have in responses to MS (Burke et al., 2010).

The construct of self-esteem (as measured by the RSES) was the third covariate included in the analysis. As stated previously there is a well-documented relationship between self-esteem and worldview defensiveness when mortality is made salient. Further, the connection between self-esteem and mindfulness is also apparent in the existing literature, such that self-esteem is negatively correlated with increased worldview defensiveness when mortality is made salient. Self-esteem is observed to reduce the need for individuals to seek other resources to combat anxiety resulting from thoughts of death.

Research Questions

The research questions to be explored were detailed in Chapter 1. Specifically, they are as follows:

RQ1: What is the correlation between one's level of mindfulness and the defending of worldviews following MS when controlling for age, sex, and self-esteem?

H_{01} : There is no relationship between mindfulness and worldview defense when one is exposed to MS while controlling for age, sex, and self-esteem.

H_{a1} : There is a relationship between mindfulness and worldview defense when one is exposed to MS while controlling for age, sex, and self-esteem.

RQ2: What is the correlation between one's age and the defending of worldviews following MS when controlling for level of mindfulness, sex, and self-esteem?

H_{02} : There is no relationship between one's age and worldview defense when one is exposed to MS while controlling for level of mindfulness, sex, and self-esteem.

H_{a2} : There is a relationship between one's age and worldview defense when one is exposed to MS while controlling for level of mindfulness, sex, and self-esteem.

RQ3: What is the correlation between one's sex and the defending of worldviews following MS when controlling for level of mindfulness, age, and self-esteem?

H_{03} : There is no relationship between one's sex and worldview defense when one is exposed to MS while controlling for level of mindfulness, age, and self-esteem.

H_{a3} : There is a relationship between one's sex and worldview defense when one is exposed to MS while controlling for level of mindfulness, age, and self-esteem.

RQ4: What is the correlation between one's self-esteem and the defending of worldviews following MS when controlling for level of mindfulness, age, and sex?

H₀4: There is no relationship between one's self-esteem and worldview defense when one is exposed to MS while controlling for level of mindfulness, sex, and self-esteem.

H_a1: There is a relationship between one's self-esteem and worldview defense when one is exposed to MS while controlling for level of mindfulness, sex, and self-esteem.

This design choice allows for participants to engage remotely, without requiring supervision of participants. As such it was thought to be less time consuming and costly to collect data for the analysis. The research did not require a follow-up to occur on a later day following the initial participation. The advantage of this is there was less likelihood of participants dropping out of the research which can skew the data and be costly, particularly if they would have already begun participation and later not completed all the required components.

Statistical analyses of the data collected was conducted using IBM software Statistical Package for the Social Sciences (SPSS), as licensed through Walden University. A multiple regression was used to determine the relationship between state mindfulness and worldview defensiveness, controlling for the aforementioned covariates. The covariates included were done so based on empirical evidence that they may affect the dependent variable of worldview defense. All data collected was included, so long as the participant correctly completed all tasks included that were provided to them. Data

from participants with incomplete or incorrectly filled out forms will be excluded. A confidence interval of 95% will be used in all relevant analyses.

Threats to Validity

Internal Threats to Validity

Since there is no personal contact to be made, and all participation was done from a computer, outside of measures done through SurveyMonkey to determine age, gender, fluency in English, and if participants identify as U.S. Americans there were no other means used to determine the accuracy of their self-reports. However, in light of using sampling from internet-based sources, Best et al. (2016) reported that internet sampling appears to be consistent with traditional sampling methods.

We are unable to know what participants may have been exposed to prior to the testing process, or what internal thoughts may be occurring even whilst engaged in the tasks outlined for them. For example, someone may have experienced the death of a loved one in the recent past, which may continue to be consciously, or subconsciously affecting them. To ensure privacy and confidentiality, this was not accounted for in this study.

External Threats to Validity

Using few criteria for participation can lead to a broad variation in population demographics which may help reduce threats to external validity. To date, the majority of TMT research has been conducted on U.S. participants, and college students. Amazon Mechanical Turk relies on participants who have previously agreed to participate in research and have done so with the possibility to gain payment or other rewards. Some

examples of the possible rewards include prizes that can be used to help charities or be redeemed for gift cards or win a sweepstakes prize. This population does represent a vast array of demographics.

Ethical Procedures

The protection of rights and privacy of participants was considered seriously. Because research was conducted through Amazon Mechanical Turk and SurveyMonkey, which are external services, ethical issues associated with recruitment were greatly minimized since all notification was emailed through those services and no other solicitation took place. No reasonable way to identify participants based on the limited demographic and personal information given is foreseen. The potential discomfort caused by participation was not expected to be high. However, resources for a help line were made available for any participant that may have felt they need help in managing the emotions evoked from participation.

Data collected through SurveyMonkey is kept secured and anonymous throughout the process. After it was collected, it was then downloaded and saved on a secure USB flash drive, which is encrypted and secured with a password and only accessed by the researcher. The data will be removed from SurveyMonkey at the completion of this dissertation. The remaining data on a secure USB flash drive will be locked in a safe for five years, after which it will be destroyed. No additional copies were made. Again, there is no foreseen way to reasonably identify participants at any time since no names, email or mailing addresses, dates of birth, or other unique characteristics were collected.

Walden University's approval number for this study is 07-12-21-0192534 with expiry on 11 July 2022.

Summary

This chapter detailed the process of this quantitative research project. Participants recruited through Amazon Mechanical Turk were given a consent form to begin. They then needed to self-identify as being of the age of majority, fluent in English, and a U.S. American. Next, they were asked to identify their age and gender. The research then included six tasks identified above, namely the RSES, the PHLMS, the MAPS, a word search puzzle, the PANAS, and a worldview defense assessment. The examination of mindfulness as a predictor of worldview defensiveness, controlling for age, gender, and self-esteem, was then carried out via multiple regression analyses using SPSS software.

Chapter 4: Results

The purpose of this study was to assess the relationship between worldview defensiveness and mindfulness when one's mortality is made salient. The aim of this investigation was to further our understanding of the possible role that mindfulness interventions may play in increasing tolerance of diverse viewpoints. A multiple regression analysis was performed to analyze the correlation between the variables of mindfulness, worldview defensiveness, self-esteem, age, and sex. SPSS (Version 27) was used under license to Walden University for demographic and statistical analysis.

Sample Demographics

Data were collected from 17 July 2021 to 19 July 2021. I recruited participants using Amazon Mechanical Turk, where they were asked to participate in a short survey for a reward of \$2.00 USD. In total, there were 116 respondents to the survey. Of those respondents, 102 completed the survey in its entirety. There were a number of respondents who provided information that was invalid. For example, some clearly copied and pasted information from another website, or in other cases the words and sentences written were not coherent. Some possible explanations for this could be that there were individuals with little to no fluency in English attempting to fill out this survey solely for the financial gain. Although this was not anticipated, these participants were very easily identified in the Projective Life Attitudes Assessment (see Appendix C). For example, when asked to "please briefly describe the emotions that your own death arouses in you" one participant simply copied and pasted the exact phrasing from the

page, thus not responding appropriately. In total, 11 participants' data were omitted for such reasons.

Out of the total 91 participants remaining, 55 (60.4%) identified as male, 35 (38.5%) identified as female, and one (1.1%) participant identified as "other/prefer to not say." The age of respondents varied from 24 to 70 years old. The mean age was 40.8 years with a standard deviation of 11.6. In general, there were more participants under the age of 45, as those age 45-70 made up only 30.8% of the participants. As such, the sample size is skewed somewhat toward the younger generation and males.

My findings on the evaluations of the pro- and anti-American essays were similar to findings of previous research, including Greenberg et al. (1992). That is, I found generally higher ratings in the responses to the pro-American essay as compared to the anti-American essay. The former had a mean score of 32.27 (out of 45) and the latter had a mean score of 23.52, with a higher score signifying a higher level of support. The Worldview Defensiveness score was found by calculating the difference between the overall rating for the pro-American essay and the overall rating for the anti-American essay for each participant. A higher score represents greater polarity in worldview, which reflects adhering more strongly to one's worldview, and being less tolerant of an opposing worldview. The mean score for Worldview Defensiveness was 13.66 (out of 45).

Research Questions

The research questions along with their accompanying null and alternate hypotheses are presented again for convenience:

RQ1: What is the correlation between one's level of mindfulness and the defending of worldviews following MS when controlling for age, sex, and self-esteem?

H₀1: There is no relationship between mindfulness and worldview defense when one is exposed to MS while controlling for age, sex, and self-esteem.

H_a1: There is a relationship between mindfulness and worldview defense when one is exposed to MS while controlling for age, sex, and self-esteem.

RQ2: What is the correlation between one's age and the defending of worldviews following MS when controlling for level of mindfulness, sex, and self-esteem?

H₀2: There is no relationship between one's age and worldview defense when one is exposed to MS while controlling for level of mindfulness, sex, and self-esteem.

H_a2: There is a relationship between one's age and worldview defense when one is exposed to MS while controlling for level of mindfulness, sex, and self-esteem.

RQ3: What is the correlation between one's sex and the defending of worldviews following MS when controlling for level of mindfulness, age, and self-esteem?

H₀3: There is no relationship between one's sex and worldview defense when one is exposed to MS while controlling for level of mindfulness, age, and self-esteem.

H_a3: There is a relationship between one's sex and worldview defense when one is exposed to MS while controlling for level of mindfulness, age, and self-esteem.

RQ4: What is the correlation between one's self-esteem and the defending of worldviews following MS when controlling for level of mindfulness, age, and sex?

H_04 : There is no relationship between one's self-esteem and worldview defense when one is exposed to MS while controlling for level of mindfulness, sex, and self-esteem.

H_a4 : There is a relationship between one's self-esteem and worldview defense when one is exposed to MS while controlling for level of mindfulness, sex, and self-esteem.

Results

A multiple regression analysis was carried out to examine the correlation between the predictors and the criterion variable. According to George and Mallery (2009), a multiple regression is to be used when two or more predictor variables are being used with a designated criterion variable. The value known as the *multiple R* is a measure of the amount of variation observed within the criterion value that can be accounted for by the predictor variable. However, before the multiple regression is rendered, one must test for the assumptions to be met.

Assumption Testing

Considering the variables used for the analysis, there are some assumptions that must be met. The first assumption to be met for running a multiple regression is that the study includes a single dependent variable, which is a continuous measure. The dependent variable in this study is worldview defensiveness, which is continuous. The second assumption is regarding the independent variables. There must be two or more independent variables, and they are to be either continuous or nominal. Sex was the only nominal variable, while the other independent variables of age, self-esteem and

mindfulness are all continuous, thus meeting the second assumption. The third assumption is that of independence of residuals. This was assessed using the Durbin-Watson statistic, which was measured to be 2.149. As such, the assumption of independence of residuals was met.

The fourth assumption, which is the assumption of linearity, was tested using partial regression plots that are presented below. The first scatterplot (see Figure 1) is comparing the studentized residuals against the unstandardized predicted values to demonstrate the relationship between worldview defense and the independent variables collectively (including age, sex, self-esteem, and mindfulness level). The additional scatterplots (see Figures 2–4) demonstrate the relationship between worldview defense and the independent variables of age, self-esteem, and mindfulness level. Sex was excluded because it is a nominal variable. The scatterplots demonstrate no linear relationship.

Figure 1

Scatter Plot of Unstandardized Predicted Value by Standardized Residual

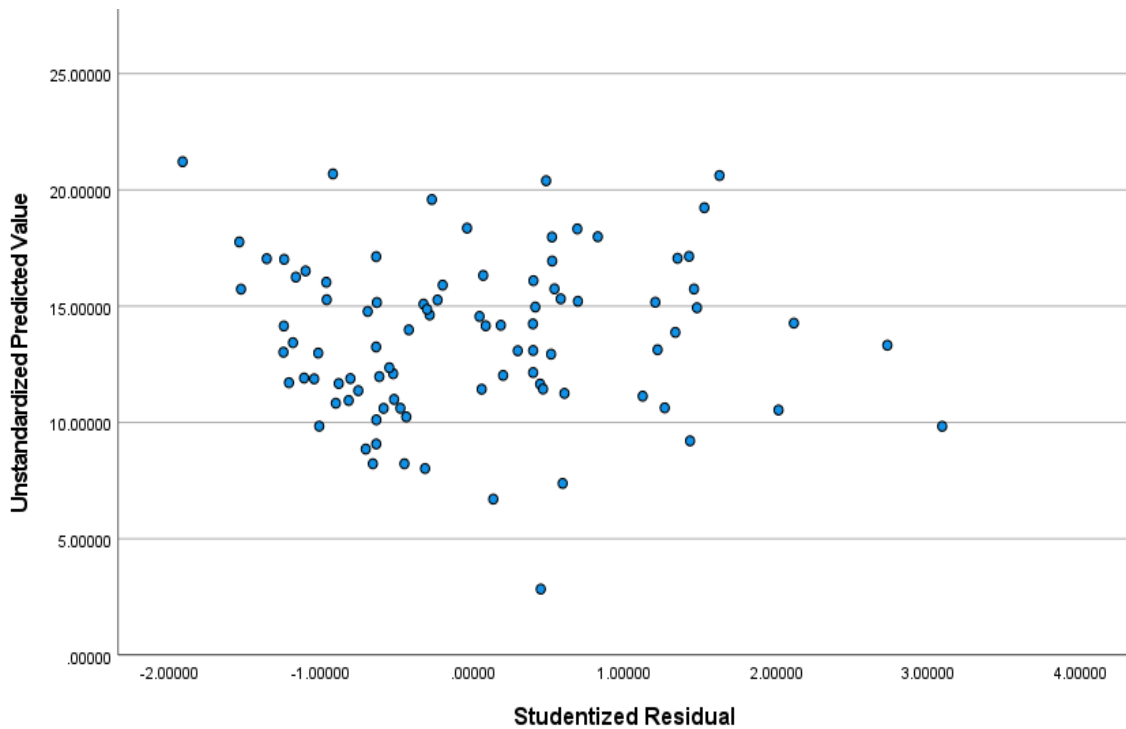


Figure 2

Partial Regression Plot: Worldview Defensiveness Versus Age

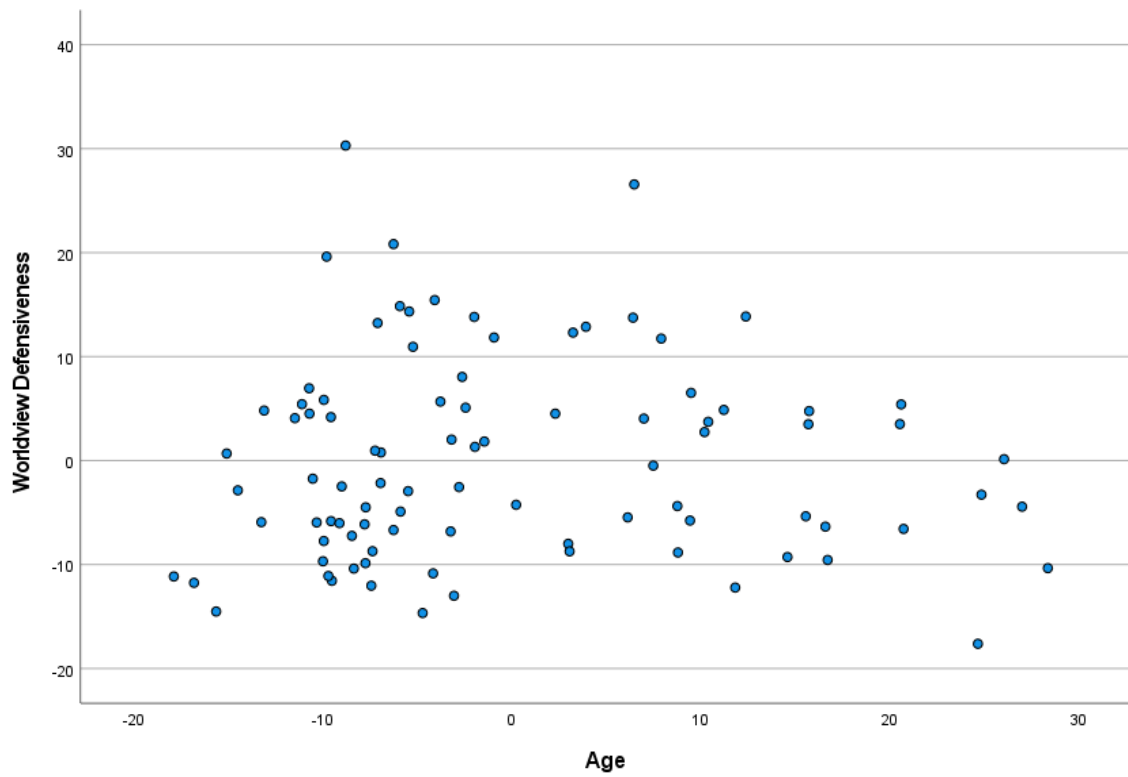


Figure 3

Partial Regression Plot: Worldview Defensiveness Versus Self-Esteem

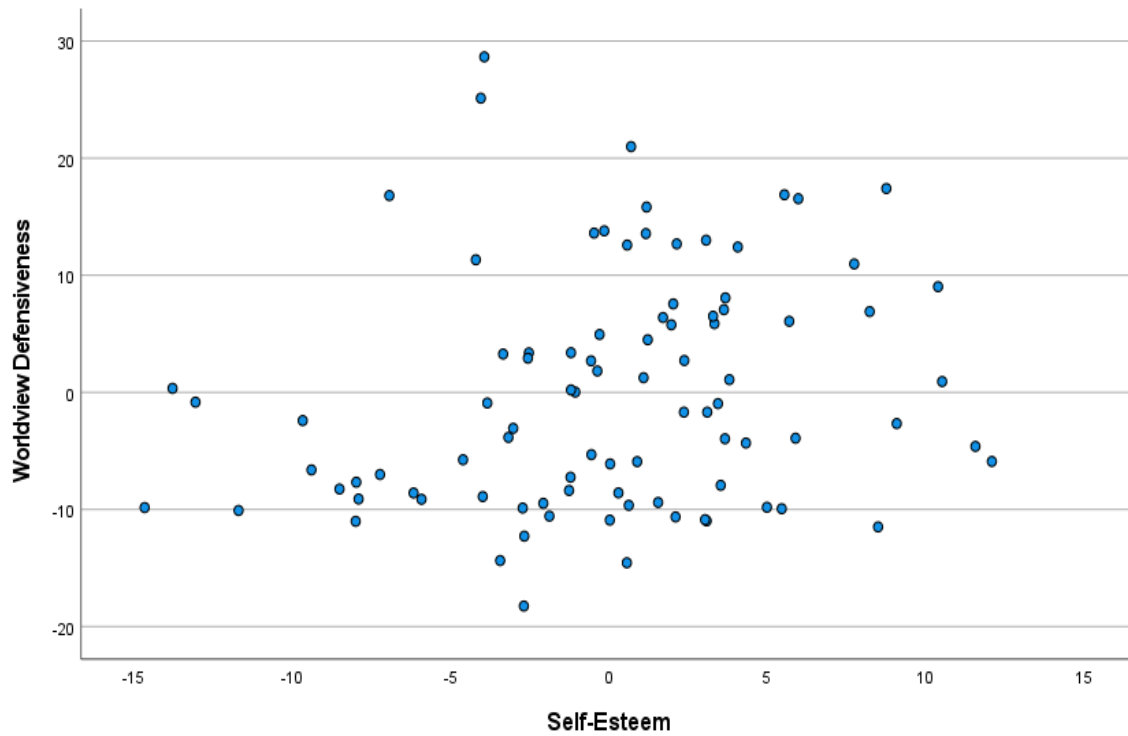
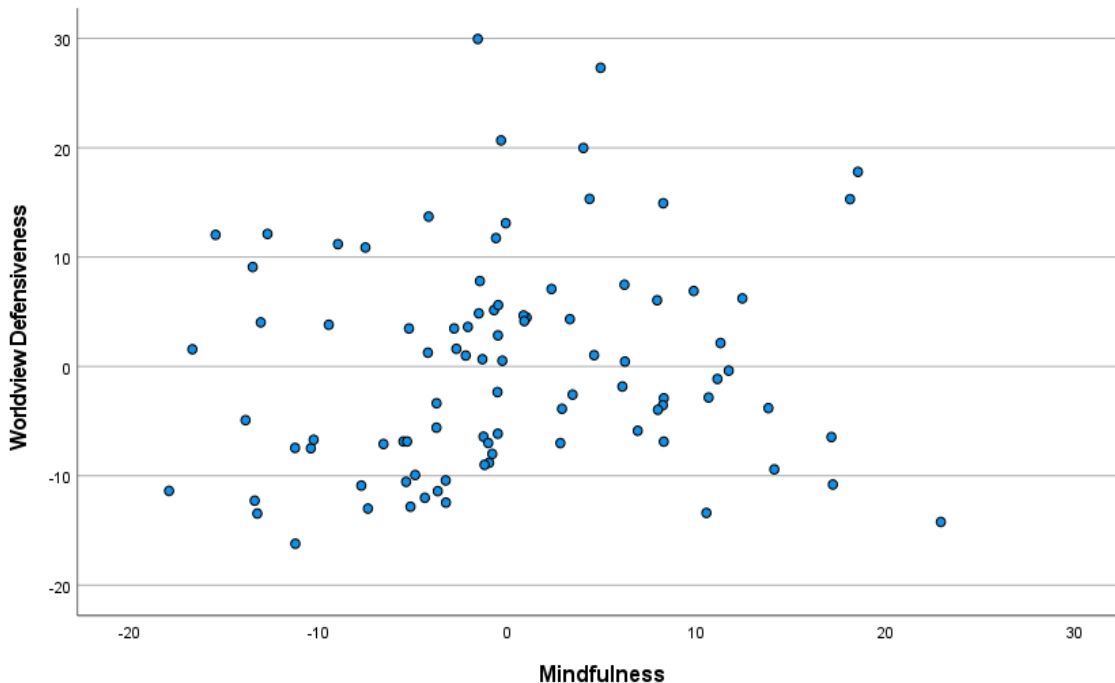


Figure 4

Partial Regression Plot: Worldview Defensiveness Versus Mindfulness



The fifth assumption of homoscedasticity was checked by inspection of Figure 1, that displays the scatterplot of the unstandardized predicted values versus the studentized residuals. As observed, the residuals are in a rectangular formation, indicating that the assumption of homoscedasticity has been met.

Additionally, the assumption that each of the variables studied is normally distributed and independent of the other scores of that same variable was to be assessed (Green & Salkind, 2008). I tested all variables in question for skewness. Table 1 displays the results from the testing, showing that all variables fall under the value of ± 1.0 , indicating normality.

Table 1*Descriptive Statistics for all Variables in Question (N = 91)*

Variable	<i>M</i>	<i>SD</i>	Skewness
Age	40.77	11.688	.834
RSES total (self-esteem)	20.36	6.595	-.552
PHLMS - awareness	37.64	7.183	-.294
PHLMS - acceptance	31.74	8.515	.129
PHLMS – global	69.37	10.211	.720
Worldview defensiveness	13.66	10.092	.029

The sixth assumption for a multiple regression is that the data must not show multicollinearity. A Pearson correlation matrix was conducted to identify the relationship between the different variables of interest for this study. As such, each variable was assessed for correlation with the other variables of interest. Tabachnick and Fidell (2012) suggested that a correlation coefficient of .80 or greater relates to significant correlation that may contribute to a violation of the assumption of multicollinearity. In the Pearson correlation (see Table 2), some significant correlations were found, but none of them reached a correlation coefficient of .80 or greater; thus, the assumption of multicollinearity was met.

Table 2*Pearson Correlation Matrix for Variables of Interest (N = 91)*

Variable	1	2	3	4	5	6
Sex	-					
Age	.104	-				
Self-Esteem	.054	.166	-			
PHLMS – awareness	.097	.024	.050	-		
PHLMS – acceptance	-.094	.096	.585**	-.162	-	
PHLMS – global	-.010	.097	.523**	.568**	.720**	-
Worldview defensiveness	.039	.038	.311**	.297**	.056	.255**

Note. (1) Sex, (2) Age, (3) Self-Esteem, (4) PHLMS – awareness, (5) PHLMS –

acceptance, (6) PHLMS – global.

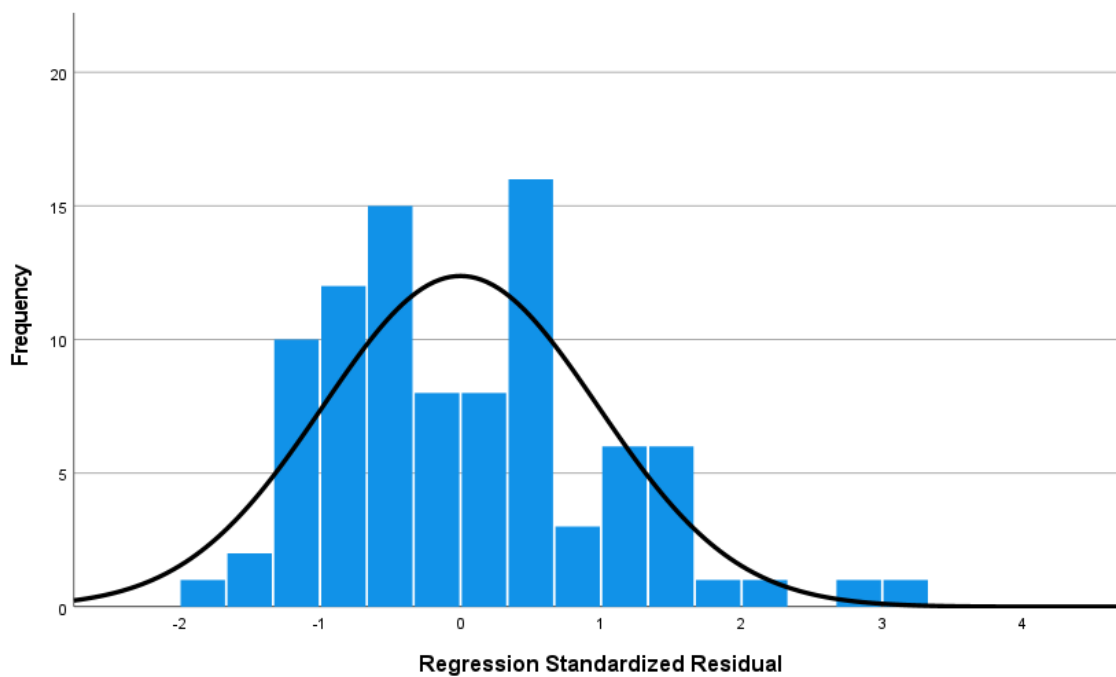
* $p < .05$, ** $p < .01$.

The seventh assumption is that there should be no significant outliers. A Casewise Diagnostics table was generated to identify the outliers, and only one was identified as such. Although it did have a standardized residual of +3.032, an analysis of the data for that specific case number did not find the data from that participant to be questionable. Further investigation of the data found no leverage points above the safe value of 0.2, and in search for leverage points there were no points found to have a Cook's Distance value above 1. As such, the removal of the outlier was deemed to be unnecessary.

Last, the eighth assumption is that the residuals are approximately normally distributed. Figure 5 demonstrates the histograms for the frequency of the regression standardized residuals. It appears to be approximately normally distributed.

Figure 5

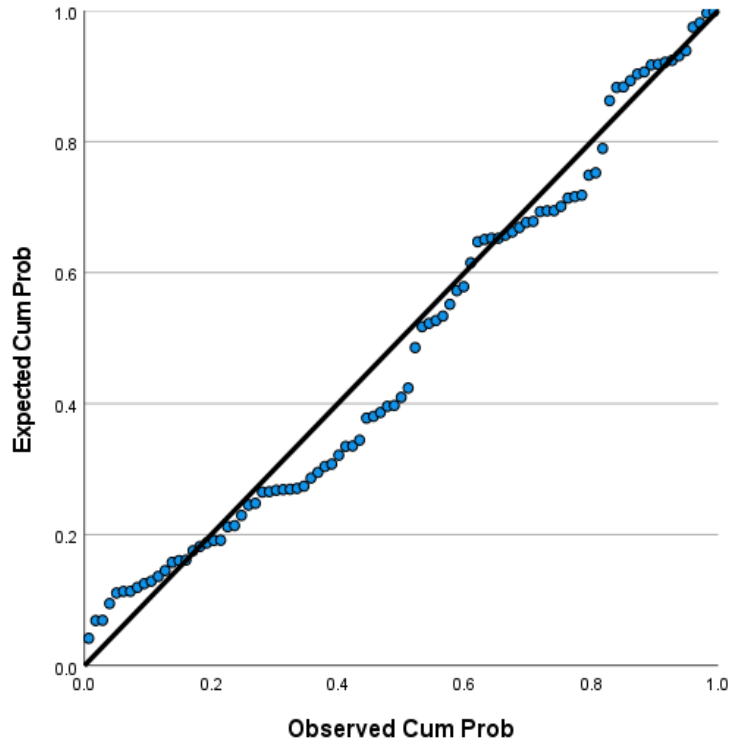
Histogram: Frequency Distribution of the Regression Standardized Residual on Worldview Defensiveness



In addition, a P-P Plot was viewed to assess the normality of the data. As seen in Figure 6 the P-P Plot confirms that the points align with the diagonal line. Thus, the assumption of normality was met.

Figure 6

P-P Plot of Regression Standardized Residual



Statistical Analysis

In order to determine how much each of the independent variables in question correlated with worldview defensiveness a standard multiple regression analysis was conducted using SPSS. The multiple regression analysis revealed an overall model that demonstrates significance $F(4, 86) = 2.647, p < .05, R^2 = .110$. This suggests that approximately 11% of the variance in worldview defensiveness is accounted for by age, sex, self-esteem level and global mindfulness score.

Table 3

Regression Analysis Predicting Worldview Defensiveness Scores from Independent Variables (N = 91)

Variable	B	SE	β	p	95% CI for B	
					LL	UL
Sex	.577	2.047	.029	.779	-3.493	4.647
Age	-.016	.091	-.018	.859	.0198	.165
Self-esteem	.382	.189	.245	.046	.008	.757
PHLMS – global	.131	.121	.130	.281	-.109	.371

Note. $R^2 = .110$ ($p < .05$); CI = confidence interval; LL = lower limit; UL = upper limit.

Of the variables listed, only self-esteem was found to be a statistically significant predictor of worldview defensiveness following MS. As such, according to this research only the null hypothesis for RQ4 was rejected with statistical significance. H_04 was that there is no relationship between one's self-esteem and worldview defense when one is exposed to MS while controlling for level of mindfulness, sex, and self-esteem. However, it is notable that the correlation between self-esteem and worldview defense was in the positive direction. This is in contrast to what was expected, as the literature review shows an overwhelming pattern of there being a negative correlation between these two variables. Thus, this research found that those higher in self-esteem actually demonstrated a higher level of worldview defense.

Post Hoc Analysis

Although there was no significant correlation measured between one's level of mindfulness as measured by the global score on the PHLMS, it is important to distinguish between the two subscales of the PHLMS. The two subscales are awareness and acceptance. The global mindfulness measure is calculated by adding these two subscales

together. When a multiple regression analysis is performed having the subscales entered as separate measures, rather than using the global mindfulness scale, it is shown that the awareness scale has a positive correlation, and the acceptance scale has a negative correlation with worldview defensiveness. Furthermore, as seen in Table 4, the correlation between awareness and worldview defense reached statistical significance, although the correlation between acceptance and worldview defense did not. This sheds further light on the relationship between mindfulness and worldview defensiveness.

Table 4

Regression Analysis Predicting Worldview Defensiveness Scores from Independent Variables (N = 91)

Variable	B	SE	β	p	95% CI for B	
					LL	UL
Sex	-.320	1.996	-.016	.873	-4.288	3.648
Age	-.015	.088	-.017	.865	-.190	.160
Self-esteem	.580	.195	.371	.004	.193	.967
PHLMS – awareness	.375	.145	.261	.011	.087	.663
PHLMS – acceptance	-.144	.152	-.119	.346	-.446	.158

Note. $R^2 = .185$ ($p < .01$); CI = confidence interval; LL = lower limit; UL = upper limit.

Summary

After ensuring that the appropriate assumptions were met, a multiple regression on the data collected was run. In response to the research questions presented, a significant correlation was only found between self-esteem and worldview defense when controlling for the other variables (see research question 4 and its accompanying hypotheses). The other research questions (see research questions 1-3) failed to reject the

null hypothesis as no statistically significant correlations were found. The existence of a significant correlation between self-esteem and worldview defense was expected, but the direction of the correlation was surprising. Although the literature review suggests a negative correlation, such that higher levels of self-esteem would correspond with lower levels of worldview defense, this research found the opposite to be true. The data demonstrates that among those with a higher level of self-esteem there is a correlation with a higher level of worldview defense.

A post-hoc analysis examined the two separate subscales of the PHLMS, which are awareness, and acceptance. The simple correlations between the two was surprisingly negative ($r = -.162$) though non-significant. A separate multiple regression was carried out using the two subscales as separate variables, rather than combined in the global PHLMS score. This regression showed awareness to be positively correlated with worldview defense. Acceptance was found to be negatively, yet not significantly correlated with worldview defense. Chapter 5 will include additional insight into the findings, as well as a more thorough interpretation of the results including implications for positive social change.

Chapter 5: Results, Conclusions, and Recommendations

TMT has been continuously expanding as a well-researched theory since Greenberg, Pyszczynski, and Solomon began publishing on the topic in 1986. The wealth of information published within this theoretical framework allows for an exploration of topics within social psychology that confound individuals and cultures throughout humanity. Investigating existential terror and its effects on human behavior and psychology is paramount because it lays the backdrop for much of the psychology observed in humankind. Through the lens of TMT, it is recognized that one's self-esteem and worldviews are intrinsically connected to the salience of mortality. As such, everyday events have the potential to motivate individuals' actions through the subconscious. These natural attempts at managing existential terror carry implications with them. Improving our understanding of these subconscious patterns allows for new approaches to better control outcomes, rendering achievement of goals more accessible.

The construct of mindfulness offers the advantage of also being a well-researched topic. A strong relationship between mindfulness and reductions in mood disorders has been repeatedly measured and reported (Khoury et al., 2015). Additional research exists that demonstrates the connection between mindfulness and defensiveness (Lakey et al., 2008), death anxiety (Hosseinzadeh & Khodabakhshi-koolaei, 2017), and self-esteem (Bajaj, Gupta, & Pande, 2016). The common themes in the research between terror management and mindfulness, coupled with the gap in literature examining the connection between the constructs of mindfulness and death-related anxiety led to this

dissertation. As previously stated, the purpose of this quantitative study was to explore the role played by mindfulness in death-related anxiety.

Contrary to what was hypothesized, global mindfulness was not significantly correlated with worldview defense under a MS condition. Although a correlation was found between self-esteem and worldview defensiveness, it was in the opposite direction of what was expected (i.e., those with higher self-esteem displayed higher levels of worldview defense).

Interpretation of the Findings

The results of the investigation were surprising initially. At face value, they appear to stand in stark contrast to the consensus of findings within the literature reviewed. As documented in Chapter 2, when exposed to existential terror, self-esteem is widely seen as a buffer against worldview defensiveness. However, this research demonstrated the opposite relationship with those scoring higher in self-esteem also showing higher levels of worldview defense. The question that emerged was how this investigation rendered results contrary to the consensus of the existing literature.

A deeper understanding of the mechanisms surrounding the relationship between self-esteem and terror management helps in providing a possible explanation for the results found in this dissertation. As observed in the literature, there is a bolstering of one's self-esteem that occurs when primed by thoughts of death (Dechesne et al., 2003). This results in a difficult dynamic that must be considered within research, as was the case in this dissertation. The timing of the self-esteem measure within research is of high importance since participants will be motivated to rate themselves as being more

accurately described by positive personality traits after considering their own mortality. For this reason, the present study was designed to administer the RSES prior to the MS task so that the results would not reflect self-esteem striving. However, in this case the MS manipulation may have had an effect on participants. The COVID-19 pandemic has led to an increase in reminders of death that participants could be exposed to on a regular basis. With news media announcing daily death counts, reminders for keeping a safe distance from others, restrictions on numbers of people allowed in certain venues, travel restrictions, and witnessing others wearing masks all stand as reminders of the pandemic occurring, which are reminders of mortality. As such, even before the participants had been primed with the MS induction task through participation in this research, they would have begun participation with mortality already salient in their minds.

This hypothesis may help to explain the positive correlation between self-esteem measures and worldview defense measures that appeared to contradict the literature. If true, the higher measures of self-esteem may be a reflection of self-esteem striving, rather than a reflection of a truly high trait of self-esteem. Considering that individuals may have begun participation with mortality already more salient due to the COVID crisis, they would be recruiting both self-esteem bolstering and worldview defense as two separate terror management strategies. In such a case, those who are more motivated to mitigate against existential terror would show elevated scores on both the RSES and on the worldview defensiveness scale as was observed in this research.

What remain poorly understood are the effects of MS on the possibility of mindfulness striving. With the assumption that participants were indeed already primed

by thoughts of death upon starting their involvement in this research, the question remains whether mindfulness would be affected in the same way that self-esteem may be. Unlike for the connection between self-esteem and terror management, there is a lack of existing literature that would help understand this relationship.

Findings from the post hoc analysis demonstrate an issue with examining mindfulness as a whole without considering its separate subscales. The mindfulness subscale of Awareness was positively correlated with worldview defensiveness at a significant level. The subscale of Acceptance was correlated negatively, but not significantly with worldview defensiveness. Although there is not a substantial amount of literature already existing on this correlation, there is some related research in the field. Desrosiers et al. (2013) reported that the facet of observing also demonstrated a positive correlation with anxiety, while the facets of nonreactivity and nonjudgment were both found to be negatively correlated with anxiety. Although awareness is not the same as observing, and acceptance may differ from the facets of nonreactivity and nonjudgment, the results of this dissertation show trends in the same directions of correlation.

It is important to point out that although a significant correlation between awareness and worldview defensiveness in the positive direction was observed, it cannot be assumed that increased awareness necessarily leads to increased worldview defensiveness. Although this is possible, other possibilities must be considered, including the idea that the opposite may be true, that high worldview defense might lead to heightened awareness, or that other constructs might influence both of these measures.

What the findings of this research provide specifically is a deeper understanding of mindfulness in the context of TMT. Importantly, the results point to a potentially important difference between the separate subscales of Awareness and Acceptance. Again, it is unclear if mindfulness striving might be a factor in the results. But it is clear that a significant correlation was measured, albeit in an unanticipated direction, when examining the subscale of awareness independently. In regard to self-esteem, it is plausible that self-esteem striving was leading to heightened scores on the RSES which correlated with the higher scores of worldview defense.

Limitations

First, a major limitation to this study is the context in which it was undertaken. A global pandemic was not foreseen in the early developmental stages of this research. Although it was recognized that participants would likely be primed by thoughts of death more so than they otherwise would have been without the pandemic, the effects it has on the findings of this study are difficult to know for certain. Individuals beginning participation with mortality already salient may have rendered the research to have been measuring constructs that were not intended. Fortunately, existing literature has offered understanding on self-esteem striving, which offers a viable theory as to the reason for the results observed. The gap in literature on the effects of MS on mindfulness is a further limitation to the understanding of the results.

The measure of worldview defensiveness used does have its limitations, which have become more apparent with the collection of this data. Research regarding the effects of MS on political views shows mixed results. As described in Chapter 2, most

researchers have found that MS leads to divergence in views, regardless of the worldview, with individuals becoming more stringent about their own beliefs and views and less tolerant of others. Some research has found an overall tendency for a shift toward conservatism when awareness of mortality is more prevalent (Cohen et al., 2017). A meta-analysis published in 2013 found that although there is some evidence for both tendencies, there is stronger evidence for polarization of political views to be the main effect (Burke et al., 2013). The significance of this research specifically sheds further light as we examine the pro-American versus the anti-American essays.

The pro-American essay focuses on the constructs of freedom and opportunity, whereas the anti-American essay focuses on inequality and greed. These are strategically used as core values that are easy for an individual to stand for or against regardless of political affiliation, allowing for individuals to be assessed similarly, regardless of their political views. However, during the global pandemic, many have seen these core values of freedom and opportunity under attack with restrictions being placed by government. This has quickly become an issue of political divide, as observed by the fact that protests against government restrictions are primarily attended by conservatives (Perrett, 2020). Thus, it is possible that the pro-American essay might have been seen as more of a politically conservative essay, rather than neutral.

In accordance with the literature review the majority of participants in this research, all of whom identified as citizens of the United States, demonstrated favorability toward the pro-American author over the anti-American author as expected. One example of research using the same worldview defense tool published by Greenberg

et al. (1992) found the mean score for agreeance with the pro-American author and anti-American author to be 6.48 and 4.30 respectively. For this dissertation, when converting the scores to a mean of the five responses, very similar results were found with mean scores of 6.45 and 4.70, respectively. A separate dissertation published in 2012 by Richards calculated worldview defense by looking at the difference between the favorability of the pro-American and anti-American scores. The results reported were also similar to this dissertation's research, where the mean score among the test group calculated was 1.65 ($s = 1.78$). This dissertation found a mean score of 1.75 using the same measurement tool. As such, there appears to be a certain level of consistency among these three separate studies despite occurring during different times and political climates, which eases concerns of the reliability of this measurement tool.

Recommendations

Through reflection on the limitations of this research, it is clear that there was an abundance of MS already occurring, which was outside of my control as the researcher due to the global COVID-19 pandemic prior to and while participants carried out the tasks involved in this research project. This unanticipated event, which may have altered the results of the investigation have been examined at length in this chapter, though only through a theoretical lens. As such, the first recommendation is for future research to repeat this same study, but in a time where there are fewer reminders of death in everyday life. As the global pandemic settles and discussions of pandemic-related topics become less commonplace, there will be value in repeating this investigation. Some of the advantages of repeating this research in a different psychosocial climate include the

comparison of results when this difficult-to-control factor of MS is different. This could help provide further insight into whether self-esteem striving and possibly mindfulness striving may be the cause for the findings observed as discussed previously.

The initial gap identified in literature, which led to this dissertation regarding the role that mindfulness may play within the context of terror management, remains a vastly understudied phenomenon. Given the amount of literature published in the field of TMT and the field of mindfulness, the relative lack of such studies is considerable. As such, there are many possibilities for further investigation, including the difference between the roles of state and trait mindfulness, and the unique roles played by the different facets of mindfulness in the context of TMT.

The implications of TMT research on clinical settings are valuable in that they can aid in the development of future treatment modalities. As discussed in Chapter 2, Lewis (2014) theorized a role of terror management in psychotherapy that does not have sufficient literature to be implemented in much capacity currently. Nevertheless, the work of Frankl (1984) supports the argument that purpose or meaning is what drives motivation for survival. Further, noted scholar Irvin Yalom (2008) remarked, “I feel strongly. . . that confronting death allows us, not to open some noisome Pandora’s box, but to re-enter life in a richer, more compassionate manner” (p. 9). As such, further research in this area is merited.

The use of brain imaging techniques is too often overlooked in psychological and sociological studies. As presented in Chapter 2, there is some understanding of brain functioning that contributes to our knowledge of the science supporting TMT. The

empirical evidence demonstrated by researchers such as Klackl et al. (2014) and Quirin et al. (2011) supports the notion that brain imaging can lend further understanding to psychological and sociological sciences.

Implications

The findings from this study have several implications for positive social change. Using TMT as a theoretical foundation assisted in this research by allowing for a well-studied backdrop to provide understanding of the mechanisms behind human motivation, behavior and emotion that is robust (Burke et al., 2010). This dissertation further adds to the understanding of such mechanisms. This is achieved by providing empirical support that mindfulness does appear to play a role in human response to thoughts (conscious or otherwise) of death and mortality. Consequently, further research is merited to continue to improve our understanding of this relationship as the awareness score was associated with significant differences in worldview defense scores. Considering that relatively few research articles are published on the relationship of these constructs to date, this does help to demonstrate a need to understand this measured correlation.

This research also supports the value of examining the different facets or dimensions of mindfulness (e.g., awareness and acceptance). Observing opposite correlations between worldview defense and the two subscales of awareness and acceptance raises questions about how other facets of mindfulness might correlate. For example, the five facets of awareness (observing, describing, acting with awareness, non-reacting, and non-judging) described by Baer et al. (2006) are of interest. Desrosiers et al. (2013) applied these five facets of mindfulness in their research on anxiety, and similar

work could be done to complement the insights gained from this dissertation in the field of terror management. What does remain apparent from this research, is that working to improve overall mindfulness may not necessarily relate to improved buffering of other responses to existential terror, including self-esteem striving and worldview defensiveness. It seems important to examine specific facets of mindfulness and how these might differentially mitigate against existential terror.

Maxfield et al. (2014) suggest that since terror management plays a considerable role in psychosocial functioning, it could be implicated in therapeutic interventions in the future. Lewis (2014) suggests that utilizing death anxiety as a form of exposure therapy which can then be mitigated with therapeutic techniques. The increased understanding of the relationship between death anxiety and mindfulness garnered from this research predicts that mindfulness techniques focused on awareness might, in actuality, increase the effects of death anxiety or terror, while techniques focused on acceptance may be more likely to minimize the effects of death anxiety.

Conclusions

This research found surprising results. A significant correlation was found between self-esteem and worldview defensiveness in the conditions of this research, but it was in the opposite direction of what was hypothesized based on the extant literature. Additionally, this research did not find mindfulness to be significantly correlated with worldview defense under the condition of MS. However, a post hoc analysis found that the individual subscales of acceptance and awareness were associated with worldview defensiveness but in opposing directions. Awareness was positively correlated, and

acceptance showed a negative though non-significant association, likely affecting the overall relationship between the total score of mindfulness and worldview defensiveness. The other variables of sex and age did not show a significant correlation with the dependent variable.

Although speculative, the unplanned factor of participants being already primed with thoughts of death due to the existing COVID-19 pandemic prior to participating may have affected the results. Self-esteem striving accounting for the positive correlation between self-esteem and worldview defensiveness seems a probable explanation for the outcomes observed.

Whether thoughts of death and reminders of mortality are due to living through a global pandemic or by other means, it remains clear that they have an impact on human psychology. Understanding how it affects us, and what can be done to mitigate against the negative effects of it are paramount.

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Appendix A: Word Search

Word Search Puzzle

Circle as many words as you can in the puzzle below.

Book	Computer
Desk	Phone
Movie	Train
Paper	School
Grass	Beer
Music	Actor

S R E T U P M O C O
 W P H O N E R E E B
 A M U S I C P Z S N
 B T N R O T C A S K
 B M R K S E D E A O
 R F O A G O L B R O
 E L G V I Z B O G B
 P A N U I N E L W Q
 A G T A B E T G D O
 P S C H O O L N I T

Appendix B: Worldview Defense Assessment

Pro American #112

The first thing that hit me when I came to this country was the incredible freedom people had. In my country of _____ everything is not as good. Here there is freedom to go to school, freedom to work in any job you want. In this country people can go to school and train for the job they want. Here anyone who works hard can make their own success. In my country most people live in poverty with no chance of escape. In this country people have more opportunity for success than in any other and success does not depend on the group belong to. While there are problems in any country, America truly is a great nation and I don't regret my decision to come here at all.

Anti American #420

When I first came to this country from my home in ___I believed it was the “land of opportunity” but I soon realized this was only true for the rich. The system here is set up for rich against the poor. All people care about here is money and trying to have more than other people. This no sympathy for people. Its all one group putting down others and nobody cares about the foreigners. The people only let foreigners have jobs like pick fruit or wash dishes because no American would do it. Americans are spoiled and lazy and want everything handed to them. America is a cold country that is unsensitive to needs and problems of foreigners. It thinks it’s a great country but its not.

QUESTIONNAIRE

1. How much do you like this person?

1 2 3 4 5 6 7 8 9
not at all totally

2. How intelligent did you think this person was?

1 2 3 4 5 6 7 8 9
not at all totally

3. How knowledgeable did you think this person was?

1 2 3 4 5 6 7 8 9
not at all totally

4. How much did you agree with this person's opinion of America?

1 2 3 4 5 6 7 8 9
not at all totally

5. From your perspective, how true do you think this person's opinion of America is?

1 2 3 4 5 6 7 8 9
not at all totally

Appendix C: The Projective Life Attitudes Assessment

On the following page are two open-ended questions, please respond to them with your first, natural response.

We are looking for peoples' gut-level reactions to these questions.

The Projective Life Attitudes Assessment

This assessment is a recently developed, innovative personality assessment. Recent research suggests that feelings and attitudes about significant aspects of life tell us a considerable amount about the individual's personality. Your responses to this survey will be content-analyzed in order to assess certain dimensions of your personality. Your honest responses to the following questions will be appreciated.

1. PLEASE BRIEFLY DESCRIBE THE EMOTIONS THAT THE THOUGHT OF YOUR OWN DEATH AROUSES IN YOU.

2. JOT DOWN, AS SPECIFICALLY AS YOU CAN, WHAT YOU THINK WILL HAPPEN TO YOU AS YOU PHYSICALLY DIE AND ONCE YOU ARE PHYSICALLY DEAD.
