IMPLICIT COGNITION AND TERROR MANAGEMENT THEORY: THE UTILITY

OF INDIRECT MEASUREMENT IN UNDERSTANDING

DEATH-RELATED DEFENSE MECHANISMS

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ABSTRACT

Implicit Cognition and Terror Management Theory: The Utility of Indirect Measurement

In Understanding Death-Related Defense Mechanisms

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The current paper was an attempt to study the defense mechanisms of terror management theory (TMT) via implicit cognition/indirect measures. In Study 1, an American and Foreign Single-Category Implicit Association Test (SC-IAT) and an American-Foreign Implicit Association Test (IAT) were used to assess implicit attitudes toward patriotism in an attempt to predict the worldview defense of patriotism in the TMT paradigm. It was hypothesized that these indirect measures would be predictive of the occurrence and strength of the worldview defense among participants primed with thoughts of mortality and not control participants. The cultural worldview defense commonly found in TMT did not arise, which precluded testing the efficacy of indirect measures as predictors. Explanations as to why the worldview defense did not arise and modifications to the design of the study are proffered. In Study 2, the automaticity of the self-esteem bolstering construct postulated by TMT was examined via an indirect measure of self-esteem (i.e., the self-esteem SC-IAT) and a measure of state self-esteem (i.e., the modified Rosenberg Self-Esteem Scale).   It was hypothesized that these measures of self-esteem would capture automatic self-esteem bolstering among participants primed with thoughts of mortality and not control participants. Both measures of self-esteem failed to capture the automaticity of the appearance of self-esteem bolstering following a

mortality salience manipulation. Explanations for the lack of detection of self-esteem bolstering and suggestions for future research into the self-esteem bolstering construct within the TMT paradigm are discussed. Finally, factors central to the successful incorporation of indirect measures into the TMT paradigm are addressed.

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CHAPTER 1
INTRODUCTION

Automatic cognitive processes have received a great deal of attention in recent psychological literature (and pop psychological literature). In *Gut Feelings*: *The Intelligence of the Unconscious*, automatic, reflexive cognitive processes are shown to lead to better decision-making and, therefore, it is argued that more trust should be vested in gut feelings (as opposed to the conscious deliberation of alternatives) (Giegerenzer, 2007). Alternatively, in *The Political Mind:* *Why You Can't Understand 21st-Century American Politics with an 18th-Century Brain*, it is argued that *reflexive* thought ought to be made *reflective* when engaging in political discourse in order to avoid the framing effects of a political party that capitalize on the automaticity of cognitive processes to sway opinion (Lakoff, 2008). Automatic cognitive processes certainly play a role in human behavior, but declarations as to their pernicious or advantageous effects are largely context-dependent and, therefore, should be made with prudence. Nonetheless, research into the effects of automatic cognitive processes in specific contexts has uncovered a great deal about human psychology and behavior. Psychologists researching implicit attitudes largely capitalize on automatic cognitive processes in order to capture implicit attitudes that are not accessible via traditional, direct measurement. One of the properties of automatic cognitive processes is that they can be unconscious, which is thought to enable parallel processing (e.g., holding a conversation while driving in traffic) and the freeing up of cognitive resources required to perform novel tasks that require consciousness (Wigley, 2007). Although not a prerequisite of automatic cognitive processes, a lack of awareness of such processes necessitates a form of

measurement other than direct measurement. Indirect measures have proven useful in understanding the nature of unconscious, automatic cognitive processes, and the application of these measures can be extended into multiple domains of inquiry.

One domain of inquiry that would benefit from the study of unconscious, automatic cognitive processes via indirect measurement is terror management theory (TMT). TMT is an attempt to explain the consequences of the fear of death in terms of defense mechanisms that arise as a result of such fears. The large majority of research in this relatively young field of inquiry, however, has relied on a single form of measurement of these defenses. Specifically, the defenses that arise in a TMT paradigm have been measured via direct measures. Because primarily direct measures are used, and hence, only explicit processes are captured, there may be additional insights to TMT that can be gained by utilizing a different instrument of measurement. As will be discussed, implicit cognitive processes have been implicated in the instigation of certain defenses in the TMT paradigm, which spells promise for the indirect measurement of these defenses.

Social psychology has seen an explosion of research involving the use of indirect measures (i.e., non-direct, non-self report measures) to assess attitudes toward various attitudinal constructs (i.e., race, gender, nationalism, political affiliation, etc.). There is debate as to what indirect measures actually are and what they measure (see DeHouwer, 2006), but for present purposes, it is sufficient to describe indirect measures as measures that assess attitudes and cognitions that may not be consciously accessible and/or controllable (Asendorpf, Banse, & Mucke, 2002; Fazio & Olson, 2003). It should also be noted that there are various classes of indirect measures. For example, some indirect measures rely on reaction time to capture implicit cognitive processes, while other

indirect measures rely on level of abstraction (see Karpinski, 2004) to capture implicit processes. Another way of distinguishing between direct and indirect measures is that responses on direct attitude measures reflect the evaluation of the attitudinal object, while indirect measures infer evaluations often via response latency tasks (like the IAT) or with self-report measures that conceal what they truly measure (Ranganath, Smith, & Nosek, 2008). Researchers suggest that the difference found between indirect and direct measures is a testament to the notion that information is processed at both implicit (i.e., automatic, nonconscious) and explicit (i.e., controlled, conscious) levels (Epstein, 1994; Epstein & Morling, 1995; Greenwald, et al., 2002). Specifically, indirect measures are more a measure of automatic, spontaneous reactions (i.e., implicit processes) where direct measures are more a measure of deliberated reactions (i.e., explicit processes). Indirect measures of Big Five personality factors, for example, were predictive of spontaneous behaviors, whereas direct measures of personality failed to capture spontaneous behaviors but were related to deliberate, self-reported behaviors (Steffans & Konig, 2006). Research also suggests that indirect measures are less susceptible to the demand characteristics (i.e., self-presentation concerns and faking, etc.) from which direct measures suffer (Kim, 2003; Steffans, 2004; Tulbure, 2006). These characteristics of indirect measures hold great relevance to the defense mechanisms examined in TMT. That is, indirect and direct measures could each be sensitive to unique aspects of the defense mechanisms that arise in TMT, which suggests that the incorporation of indirect measures could lead to an enhanced picture regarding the nature of and processes behind defensive reactions in TMT.

Foundations and Background of Terror Management Theory

Terror management theory (TMT) addresses the implications of the unique human awareness of mortality (Greenberg, Solomon, & Pyszczynski, 1997; Pyszczynski, Greenberg, & Solomon, 1999; Solomon, Greenberg, & Pyszczynski, 1991). The roots of TMT trace back to the philosopher, Ernest Becker (see Becker, 1973). Humans are highly social, intelligent, and self-aware (Solomon, Greenberg, & Pyszczynski, 2003). Self-awareness, in particular, can produce an existential anxiety or fear that the organism must somehow buffer in order to function. With self-awareness comes the ability to analyze one's past and to think about one's future. Although the future is marked by many uncertainties, death is one future certainty that must be reconciled. That is, the human hallmark of self-awareness not only results in the recognition that one is alive, but also results in the awareness that one will eventually die. Indeed, by elevating participants' self-awareness, an increase in the accessibility of death-related thoughts results (Silvia, 2001).

In order to quell the existential anxiety that results from mortality awareness, various defense mechanisms are triggered. A defense mechanism, from a TMT framework, is a behavior or attitude that results from a death reminder, and is designed to buffer the potential experience of death anxiety (Sowards, Moniz, & Harris, 1991). The defenses proposed by TMT are: a.) cultural worldview defense and/or b.) self-esteem bolstering. TMT offers explanations for behaviors and attitudes often attributed to conscious reasoning, and recasts many of these behaviors and attitudes into a largely unconscious defense-against-death mold.

Culture has a death-anxiety reducing property via prescribing appropriate social behavior for individuals to live up to and, hence, allows them to perceive their lives as meaningful. Further, culture explains what happens after death and provides a sense of immortality both symbolically (via art, family, identification with an institution, heroism, etc.) and literally (via religion) (Solomon et al., 2003). In essence, culture provides meaning, which allows for the experience of the feeling that death can be transcended. Cultural worldviews manage terror by providing standards to live up to and by which judgments of others can be made. Those who live up to the cultural standards yield recognition within that culture that extends beyond one's physical life, which thereby generates a sense of immortality.

An example of a cultural worldview defense mechanism that comes into operation when mortality is made salient includes derogation of outgroups/ingroup favoritism (Castano, 2004; Greenberg et al., 1990). When exposed to a mortality salience manipulation, participants displayed stronger ingroup identification, scored higher on ingroup bias measures, and were more likely to perceive greater ingroup entitativity compared to a control group (Castano, Yzerbyt, Paladino, & Sacchi, 2002). Another example of cultural worldview defense is increased patriotism (Thomas, 2003). It is thought to be a worldview defense because patriotism upholds the cultural values that provide protection from concerns with mortality. Participants exposed to a mortality salience manipulation took longer to use the American flag in an inappropriate manner relative to controls, which can arguably be considered increased patriotism (and certainly constitutes a worldview defense). Not only is there evidence for increased adherence to the ideology of one's culture when under mortality threat, but also an increased direct

investment in one's culture via increased levels of materialism and consumption when threatened with mortality (Arndt, Solomon, Kasser, & Sheldon, 2004). Finally, it should be noted that the cultural worldview defense (i.e., ingroup bias, patriotism, etc.) is a robust phenomenon that occurs cross-culturally in response to mortality threats (Tam, Chiu, & Lau, 2007; Heine, Harihara, & Niiya, 2002). Ingroup biases and patriotism are not limited to Western culture. In a study exploring the defenses that arise in non-Western cultures (i.e., collectivist cultures), Chinese students exposed to a mortality salience manipulation showed ingroup bias/outgroup derogation via disproportionately allocating scarce resources to only ingroup members (which is a group that most likely shares their own worldview) (Tam et al.).

The other defense mechanism postulated by TMT is the bolstering of one's self-esteem. The primary function of self-esteem, according to TMT, is to buffer anxiety that results from our awareness of death (Greenberg, Pyszczynski, & Solomon, 1986). A healthy self-esteem is anxiety reducing (Xiangkui & Lumei, 2005), especially anxiety caused by an awareness of mortality (Harmon-Jones et al., 1997). According to TMT, self-esteem is derived from the belief that one is an individual of value in a world of meaning (i.e., culture) (Solomon, Greenberg, Pyszczynski, 2004). Because the conception of self-esteem within TMT involves a heavy dependence on living up to cultural standards, most studies involving self-esteem measure adherence to cultural standards important to the individual as an indirect measure of self-esteem (see Greenberg et al.). Only if the behavior and/or attitude is domain-relevant will it arise as a self-esteem bolstering defense mechanism (see Crocker & Wolfe, 2001 for a similar construct of self-esteem). For example, researchers examined the effects of mortality

salience on participants with either a low or high personal investment in physical strength, which demonstrated the importance of considering individual contingencies of self-esteem (Peters, Greenberg, Williams, & Schneider, 2005). Following an initial measurement of physical strength and a mortality salience manipulation, these researchers found that for only those individuals for whom strength was self-esteem relevant did an increase in strength output occur as measured by squeezing a hand dynamometer. One could argue that the fact that self-esteem, as conceptualized by TMT, is predicated on cultural norms renders it nearly indistinguishable from a worldview defense when mortality is threatened. The few early terror management studies that have used self-esteem as a dependent variable failed to find any effects of mortality salience on self-esteem (personal correspondence with S. Koole, personal communication, June 9, 2007; Sowards et al., 1991). Studies in this paradigm typically do not use self-esteem as a dependent variable, which sets up a blur between the self-esteem defense and the cultural worldview defense.

<div align="center">Dual Process Theory: Proximal & Distal Defenses</div>

There are both conscious and unconscious aspects to the defense mechanisms that arise under mortality threat, thus leading to the postulation of a dual-process theory (Pyszczynski et al., 1999). Proximal defenses, which are rational and threat focused, arise when death thoughts are in current focal attention (i.e., directly after an explicit mortality salience manipulation). Proximal defenses deal with the problem of death directly by pushing death thoughts out of consciousness and focal attention via suppression. Suppression is achieved by means of distraction or by denying one's vulnerability to an early demise by biasing one's normal, rational inferential processes

(Pyszczynski et al.). For example, vowing to eat healthier or exercise more regularly are examples of proximal defenses because they deal with the problem of death directly via attempting to prolong life.

Distal defenses, on the other hand, involve self-esteem bolstering and worldview defense, the previously discussed main defenses postulated by TMT. These defenses are experiential in nature and can be unrelated to death, and they occur when death thoughts are highly accessible, but not conscious (i.e., after a distraction from an explicit mortality salience manipulation or directly after the subliminal presentation of death-related stimuli). Given consciousness is bypassed with the case of subliminally presented death stimuli, accessibility of death thoughts is high immediately following the subliminal presentation of death stimuli (Arndt, Greenberg, Pyszczynski, & Solomon, 1997). That is, death-related thoughts are highly accessible but outside of conscious awareness when death stimuli are subliminally presented. Individuals are often unaware of the defenses underlying their behavior given death thoughts are not conscious. The more distal the defenses become, the less the defense appears to be related to the threat (Pyszczynski et al., 1999). Further, because the threat is outside of consciousness, it is outside of conscious control and, hence, it likely set off a cascade of activation of associated concerns that make the threat more devastating and broad in scope (Pyszczynski et al.).

The role of proximal and distal defenses is highlighted by a study involving the examination of fitness intentions as a defense against death-related thoughts (Arndt, Schimel, & Goldenberg, 2003). In that study, the importance of fitness to participants' self-esteem was first assessed. This was done in order to determine whether or not fitness intentions would increase as a distal defense for those participants who held fitness

central to their self-esteem. Fitness intentions were expected to increase as a proximal defense for all participants given it constitutes a rational, threat-focused defense. Indeed, both high and low fitness-esteem participants responded to an explicit mortality salience manipulation with exaggerated fitness intentions (Study 1). When a delay and distraction task followed the mortality salience manipulation, however, exaggerated fitness intentions emerged as a distal defense among only those participants whose self-esteem was based on fitness (Study 2). These results fall in line with the distal defense of self-esteem bolstering, which is postulated to arise when death-related thoughts are outside of conscious awareness and only when the defense is important to the individual's self-esteem. This study illustrates not only the manner in which proximal and distal defenses arise, but also blurs the black-and-white distinction typically made between proximal and distal defenses (i.e., distal defenses can be rational and threat focused if they are important to self-esteem).

<center>Implications: TMT & Implicit Cognitive Processes</center>

Given many cognitive processes occur automatically and often outside of conscious awareness (Bargh, 1994; Gazzaniga, 1998; Kihlstrom, 1987; Nisbett & Wilson, 1977; Wilson, 2002), the automatic nature of cognitive processing plays a significant role in the evocation of feelings and behaviors. Measures that capture implicit cognition are thought to be predictive of automatic, spontaneous, nondeliberative behaviors, while direct measures, in contrast, are predictive of controlled, deliberative behaviors (Fazio & Olsen, 2003). Several studies have supported this contention (Asendorpf et al., 2002; Friese, Wanke, & Plessner, 2006; Heider, 2006). Although it has not been empirically established, distal defenses are postulated to be automatic and nondeliberative, and

indirect measures of cognition prove useful when attempting to understand behaviors like distal defenses that are not under conscious control.

Cognitive psychological research suggests that there are multiple memory systems and information-processing systems (Tulving, 1985), which have different roles of involvement in the defenses that emerge according to TMT. For example, an experiential mode of thought is characterized by an automatic, crude, and efficient way of processing information, which is similar to the implicit processing of information. This mode of thought is often neither conscious nor logical. When in an experiential mode of thought, individuals are more likely to engage the distal defense mechanisms as postulated by TMT when mortality is made salient than are individuals who are in a rational mode of thought (Simon et al., 1997). An experiential mode of processing death-related information has also been implicated in the increased accessibility of death-related thoughts (Arndt et al., 1997). Specifically, when in an experiential mode of processing, death-related thoughts increase in accessibility when death-related information is presented outside of consciousness (i.e., subliminally). Further, this form of processing results in the instigation of distal defenses (Arndt et al.). The rational mode of thought, on the other hand, involves deliberate, explicit cognitive processes, which results in proximal defenses (Greenberg, Pyszczynski, Solomon, Simon, & Breus, 1994, Study 4). Therefore, in a typical TMT paradigm, participants must be in an experiential mode of thought, which involves implicit or spontaneous processing, in order to yield the distal defensive reactions given that they are likely so ingrained and are hypothesized to occur virtually automatically.

The few studies that have incorporated indirect measures into death research have revealed that they are adequate in terms of reliability and validity (Bassett, Washburn, Vanmen, & Dabbs Jr., 2004), there is a discrepancy between implicit and explicit attitudes toward death, which resulted in differential behavioral predictive abilities (Bassett & Dabbs Jr., 2003), and that there is an increase in implicit death anxiety/concern, but no changes in explicit death anxiety in an anxiety-buffer paradigm (Bassett, 2005). The overwhelming majority of TMT studies, however, have been conducted with direct measures. This has been the case despite the fact that the few studies that have utililized measures other than direct measures (i.e., indirect measures, physiological measures, etc.) have yielded informative results that would not have been obtained if there was a sole reliance on direct measures (Arndt, Allen, & Greenberg, 2001; Bassett, 2005; Bassett & Dabbs, 2003).

One study to utilize an indirect measure of implicit cognition in a TMT paradigm involved the examination of the relation between implicit death attitudes via the IAT and explicit death attitudes among funeral students and university students (Bassett & Dabbs Jr., 2003). The IAT was administered in paper and pencil format and measured death valence (death and life associations with bad and good), death anxiety (death and life associations with anxious and calm), and death denial (death and life associations with self and others). In Study 1, both groups (funeral and university students) exhibited strong associations between death with anxious and bad on the IAT. Further, higher scores on explicit death anxiety were associated with more implicit death denial. Interestingly, funeral students showed lower scores on both a direct death anxiety measure and an IAT of death denial. These results suggest that although funeral students

may outwardly appear to be less anxious about death (on direct measures), they nonetheless show the same level of implicit anxiety about death as university students (on indirect measures). However, funeral students displayed lower levels of death denial than university students on an indirect measure. It should be noted that IATs are typically administered via computer, so caution is warranted when interpreting the results of paper-pencil IATs. In Study 2, a palm pilot version of the IAT was utilized (to measure death valence, anxiety, and denial), and findings showed that higher self-reported death anxiety was associated with a lower approval of physician-assisted suicide. Further, higher levels of implicit denial of death were associated with a decreased interest in living wills and funeral prearrangements for oneself. This study is pivotal in that it suggests that there is a discrepancy between our implicit and explicit attitudes toward death, which have differential behavior implications. An indirect measure yielded information regarding behaviors (i.e., writing a living will, making prearrangements for one's funeral, etc.) that would have otherwise gone unidentified with direct measures.

In another study that utilized the palm pilot version of the IAT as a measure of death anxiety, participants who were exposed to a cultural worldview threat condition displayed an increase in implicit death anxiety/concern, but no changes in explicit death anxiety (Bassett, 2005). To reiterate, the cultural anxiety hypothesis states that if a valued aspect of one's cultural worldview is threatened, an increase in death thoughts will occur. By incorporating a measure of implicit cognition, an increase in implicit death anxiety/concern was detected where direct measures of death anxiety would have proven useless.

Finally, in an attempt to assess the effects of MS presentations on affective responses, facial electromyographic (EMG) revealed an increase in corrugator activity in response to death but not pain subliminal primes (Arndt et al., 2001). This increased activity can be interpreted as an automatic affective reaction to implicit reminders of mortality. The fact that this study found an automatic affective reaction to an MS manipulation via indirect means, however, suggests that MS manipulations induce automatic processes that perhaps go unnoticed due to the widespread use of direct measures in TMT research. The reliance on direct measures has been the norm despite the fact that distal defenses arise when death thoughts are not conscious, but highly accessible. That is, implicit cognitive processes are involved in the instigation of the defenses postulated by TMT, but the majority of TMT research has investigated explicit cognition.

As previously mentioned, researchers have postulated that direct measures are most likely better predictors of proximal defenses, while indirect measures better predict distal defenses (Bassett & Dabbs, 2003). Direct measures tap conscious, deliberative behaviors, which makes them amenable to predicting rational, conscious, threat-oriented proximal defenses, while indirect measures tap automatic, spontaneous reactions to stimuli outside of conscious awareness (as in MS paradigms), which makes them amenable to experiential, non-threat related distal defenses. Study 1 is an attempt to establish the predictive ability of indirect measures to predict distal defenses. The TMT literature is rife with evidence that mortality salience manipulations affect direct measures of distal defenses. This has been a reliable, robust finding. One question that has yet to be answered is whether or not the strength of these effects can be predicted.

Whether self-esteem initially drops or is bolstered as an automatic response to death-related thoughts is unknown. These are issues that can be investigated via the incorporation of indirect measures in TMT research, especially given the fact that implicit cognition (i.e., implicit self-esteem) is thought to be effective in threat detection (Conner & Barrett, 2005), is susceptible to fluctuations as a result of changes in the immediate environment (Pelham & Hetts, 1999), and is automatic and nonconscious (Greenwald & Banajii, 1995). Study 2 is an examination of the effect of mortality reminders on implicit self-esteem via the indirect measurement of self-esteem.

CHAPTER 2
STUDY 1

The goal of Study 1 is to predict the strength of defensive reactions to a mortality salience manipulation via indirect measures. Previous studies have examined only whether or not a defensive reaction would occur in response to a mortality salience manipulation. Indirect measures of patriotism are expected to be significantly correlated with and significant predictors of the cultural worldview distal defense when exposed to a mortality salience manipulation. In line with one of the main postulates of terror management theory, death-related awareness results in an increased need for the validation of one's worldview and, therefore, a decreased tolerance for anyone who threatens or violates that worldview and increased positive reactions to those who uphold the cultural worldview (Greenberg et al., 1990; 1992; Rosenblatt et al., 1989). Several studies have established the cultural worldview distal defense. In one study, participants exposed to a mortality salience manipulation reported significantly more uneasiness and difficulty with a problem whose solution required the inappropriate use of the American flag than a control group (Greenberg, Simon, Porteus, & Pyszczynski, & Solomon, 1995). Commonly, in order to assess mortality-primed participants' reactions to individuals who violate or uphold the prevailing cultural worldview, participants are presented with an essay purportedly written by a foreigner that either defends or violates the prevailing cultural worldview, and subsequently complete interpersonal and trait ratings of the worldview violator/upholder (Greenberg et al., 1990; 1992; Rosenblatt et al.). American participants in a mortality salience condition who were led to believe they were evaluating a foreigner's description of the United States, displayed stronger negative reactions than participants in the control group to the target author when the essay had an

anti-American tone rather than a pro-American tone (Greenberg, Simon, Pyszczynski, Solomon, & Chatel, 1992). Further, mortality primed participants displayed more favorable reactions to the target author of a pro-Americn essay in comparison to the control group (Greenberg et al., 1992). Death-primed participants have also been shown to convey negative, stereotypical judgments of individuals of a different nationality and are more careful in classifying members of their own nationality than participants in a control group (Castano, 2004). The robustness of the patriotic defense is evident by the finding that greater ingroup bias in personal evaluations and greater intergroup bias in the allocation of resources was found among Chinese samples exposed to a death reminder compared to a control group (Tam, Chiu, & Lau, 2007). The defense of increased patriotism against death reminders is arguably a universal one given it has been shown to occur not only among North American and European samples, but also Asian samples who are more likely to adopt an Eastern philosophical stance that is generally tolerant of others (Tam et al.). Given this is an established distal defense in the TMT literature, it is a prime candidate to serve as a distal defense whose strength can be predicted by indirect measures.

In line with the previously discussed research, it is hypothesized that participants in the mortality salience (MS) condition will show a worldview defense where control participants will not. Specifically, MS participants will more favorably rate the author of a pro-American essay and more harshly rate the author of an anti-American essay than control participants. In Study 1, indirect measures of patriotism will be administered prior to exposure to the terror management paradigm (i.e., mortality salience manipulation). Therefore, it is also hypothesized that indirect measures of patriotism will

be significantly correlated with the distal worldview defense among participants exposed to a mortality salience manipulation. Specifically, high levels of implicit patriotism as measured by the Implicit Association Test (IAT) should be positively correlated with ratings of the target author of a pro-American essay and negatively correlated with ratings of the target author of an anti-American essay among only MS participants. The Single Category-IAT (SC-IAT) is a variation of the IAT where only a single attitudinal category is assessed instead of having a contrast category as in the IAT. It should be noted that both the SC-IAT and IAT have been labeled as indirect measures that tap into environmental/cultural associations as opposed to personally endorsed associations one has with an attitudinal target (Karpinski & Hilton, 2001; Karpinski & Steinman, 2006).

There are benefits, however, to including both the SC-IAT and IAT: the prediction of unique variance and to maximize prediction (given both measures may yield unique information). Karpinski (2004) demonstrated that the IAT is difficult to interpret and susceptible to unwanted influences due to the fact that it does not measure the associations with a single category, but instead, is a comparative measure of associations between two concepts.

To remove the comparative aspect of the IAT, Karpinski and Steinman (2006) devised a modified version of the IAT, the SC-IAT. The SC-IAT addresses the comparative aspect inherent with the IAT by modifying it such that there is only a single attitudinal construct. By measuring the strength of evaluative associations with a single category, Karpinski and Steinman found the SC-IAT made unique contributions in the ability to comprehend various social cognitions (i.e., soda brand preferences, self-esteem, and racial attitudes) over the IAT. The IAT is beneficial in circumstances where there is

a relative effect. Researchers note that socially significant categories often form complementary pairs (i.e., male-female, young-old, liberal-conservative, etc.), which renders the IAT an acceptable indirect measure of implicit attitudes (Greenwald & Farnham, 2000).

If levels of patriotism are better conceptualized relative to attitudes toward foreigners, the IAT may provide unique insights. Simply put, if participants engage in an us-verses-them mentality, the IAT would prove advantageous in predicting the strength of the distal worldview defense. On the other hand, the SC-IAT would be beneficial in circumstances where a single category is of interest (i.e., implicit attitudes toward foreigners or attitudes toward Americans in the form of a Foreign SC-IAT and American SC-IAT, respectively). If patriotism or attitudes toward foreigners are better conceptualized as single categories (as opposed to relative ones), the SC-IAT may provide unique insights in the prediction of the distal worldview defense. For example, the SC-IAT can tease apart outgroup derogation and ingroup favoritism as responsible factors contributing to the distal defense of patriotism.

Keeping these considerations regarding the SC-IAT in mind, it is also hypothesized that high scores on the American SC-IAT (an indirect measure that assesses attitudes toward Americans only) will be positively correlated with ratings of the author of a pro-American essay among MS participants. It is also hypothesized that high scores on the Foreign SC-IAT (an indirect measure that assesses attitudes toward foreigners only) will be positively correlated with ratings of the author of the anti-American essay among MS participants. Lastly, neither the IAT nor the SC-IATs are hypothesized to

predict anything among participants in the control group given there is no exposure to mortality salience, and thus, no distal worldview defense.

Method

Design

Study 1 employed a between-subjects two-by-two design, investigating the predictive power of indirect measures of the strength of the distal defense of patriotism that arises in response to a mortality salience manipulation. Participants were randomly assigned to either an MS condition or control condition, and were subsequently exposed to either a pro-American or anti-American essay.

Participants

Data were collected from 137 undergraduate university students (47 men and 90 women). Participants were between the ages of 17 and 31, with a mean age = 20 years. The study was conducted at Temple University, a large, urban university in the northeast section of the country. The majority of the sample used in the present study was Caucasian (60%), followed by Blacks (20%), Asians (11%), Hispanics (4%), and 5% identified as "other." Of the 133 participants, 112 (84%) identified themselves as American-born citizens, and 21 (16%) identified themselves as not being citizens of the United States. Participants volunteered to participate as part of course credit for an introductory psychology course, and were fully debriefed upon completing the study.

Overview of Procedure

Participants completed the following indirect measures: two counterbalanced SC-IATs (i.e., American SC-IAT and a Foreign SC-IAT) and an American-Foreign IAT. There were four conditions: a mortality salience condition (MS condition) whereby

participants were instructed to write about their own mortality, which was followed by the reading of either a pro- or anti-American essay, and a control condition whereby participants were instructed to write about dental pain, which was also followed by the reading of either a pro- or anti-American essay. Finally, the following measures constituted the measurement of the distal defense of patriotism: an evaluation questionnaire regarding the author of the essay, the Interpersonal Judgment Scale (IJS), and finally, trait ratings of the author of the essay.

Procedure

Participants were run in a group of up to 4 individuals and all data were collected via desktop computers. Upon entering the lab, participants were greeted by the experimenter and subsequently read and signed informed consent forms. After the collection of consent forms, participants were given numbers for identification to ensure anonymity.

Participants first reported demographic characteristics about themselves (i.e., gender, ethnicity, age, and whether or not they were American-born citizens), which was followed by both computer-based and verbal instructions for the SC-IAT (the American SC-IAT and Foreign SC-IAT were counterbalanced). Following completion of the counterbalanced SC-IATs, participants completed the American-Foreign IAT. Karpinski and Steinman (2006) suggest the SC-IAT be completed before the IAT to avoid contamination of the SC-IAT. The IAT is a comparative measure. Once in a comparative state of mind, it may be difficult for participants to get out of this comparative mind state. That is, participants may continue to use the contrast category even when it is not specified in the SC-IAT.

All implicit measures were completed before explicit measures so that no contamination of implicit measures occurred (Bosson, Swann, & Pennebaker, 2000). Bosson et al. found higher correlations among implicit measures of self-esteem and explicit measures of self-esteem and between implicit measures and criterion variables when implicit self-esteem was measured after explicit measures. This suggests that when explicit measures are completed before implicit measures, the construct of interest is explicitly primed, which affects subsequent responses on implicit measures.

At the conclusion of the IAT, participants were randomly exposed to either a mortality salience manipulation condition or a control condition. Following this, participants completed a crossword puzzle as a distractor task. Next, participants were randomly assigned to an anti or pro-American essay exposure, where they read an essay that was either pro or anti-American in tone. This was followed by direct measures designed to assess participants' attitudes toward the author of the essay (i.e., the measure of the distal defense of patriotism). The direct measures were completed in the following order: evaluation questionnaire, Interpersonal Judgment Scale, and finally, trait ratings. At the conclusion of the trait ratings, participants were asked to identify the country of origin for the two flags used as stimuli in the indirect measures. At the conclusion of the experiment, participants were fully debriefed. The duration of the experiment was approximately 1 hour.

Measures

American SC-IAT. The SC-IAT is a modification of the Implicit Association Test (IAT) that measures the associations with a single attitudinal object (Karpinski & Steinman, 2006). The American SC-IAT measured the ease with which participants

associated *American* with *good* versus *American* with *bad*. Each block of the SC-IAT began with a screen of instructions that indicated the category dimensions and appropriate key responses. Target words appeared on the center of the screen, and the bottom fourth of the screen showed category reminder labels. Target words remained on the screen for 1500 ms or until the participant's response. The reminder "Please respond more quickly!" appeared for 500 ms in the center of the screen if participants failed to respond within the 1500 ms window period. Participants were given feedback after each response, with a green O in the center of the screen for 150 ms after each correct response, and a red X in the center of the screen for 500 ms following an incorrect response.

The American SC-IAT consisted of two counterbalanced blocks, each with 96 trials. In each trial, participants viewed a randomly selected stimulus word or picture from one of three categories (*American*, *good*, *bad*). In the first block, *American* and *good* were in one category (assigned to the z key), and *bad* was in another category (assigned to the 2 key). In each block of 24 target stimuli, 7 were *American*-related pictorial stimuli, 7 were *good*-related words, and 10 were *bad*-related words. In the second block, *good* was in one category (assigned to the z key), and *American* and *bad* were in another category (assigned to the 2 key). In each block of 24 target stimuli, 10 were *good*-related words, 7 were *American*-related pictorial stimuli, and 7 were *bad*-related words. The target words were *beautiful, celebrating, cheerful, excellent, excitement, fabulous, friendly, glad, happy, joyful, laughing, loving, marvelous, pleasure, smiling, splendid, superb, paradise, terrific, triumph,* and *wonderful* for the category label *good*, and *brutal, destroy, dirty, disaster, disgusting, dislike, evil, gross, hate,*

horrible, humiliate, nasty, noxious, painful, revolting, sickening, terrible, tragic, ugly,

unpleasant, and *yucky* for the category label *bad* (see Appendix A for pictorial stimuli for

the category label *American*).

Consistent with Karpinski and Steinman (2006), SC-IAT scores were computed

via a D-score algorithm, with higher scores indicating greater associations of *American*

with *good* than *American* with *bad*. An analysis of the reliability of the American SC-

IAT utilized in Study 1 yielded a medium Cronbach's α score of .69.

Foreign SC-IAT. The Foreign SC-IAT measured the ease with which participants

associated *Foreign* with *good* versus *Foreign* with *bad*. The format of the Foreign SC-

IAT was identical to the American SC-IAT, except the target category *American* was

substituted with the target category *Foreign*. In the first block, *Foreign* and *good* were in

one category (assigned to the z key); *bad* was in another category (assigned to the 2 key).

In the second block, *good* was in one category (assigned to the z key); *Foreign* and *bad*

were in another category (assigned to the 2 key). Target words for the *good* and *bad*

categories in the Foreign SC-IAT were identical to the American SC-IAT (see Appendix

B for pictorial stimuli for the *Foreign* category).

The Foreign SC-IAT scores were also computed via a D-score algorithm, with

higher scores indicating higher associations of *good* with *Foreign* than *bad* with *Foreign*.

The Foreign SC-IAT displayed a medium level of reliability with Cronbach's α = .63.

American-Foreign IAT. In an IAT which measures implicit patriotism, patriotism

was assessed by comparing the speed of responding when (1) *American*-related stimuli

were paired with *good* AND *Foreign*-related stimuli with *bad* with the speed of

responding when (2) *Foreign*-related stimuli were paired with *good* AND *American*-

related stimuli were paired with *bad*. The IAT is a five-stage procedure with stages 3 and 5 being critical blocks (Greenwald, McGhee, & Schwartz, 1998). The difference between the speed of responding between these blocks was the measure of implicit patriotism. Blocks 2 and 4 and blocks 3 and 5 were counterbalanced.

In the first block, *good*-related words were paired on the left key (i.e., the *A* key), and *bad*-related words were paired on the right key (i.e., the *5* key) for 30 trials. In the second block, *American* was paired on the left key and *Foreign* was on the right key for 30 trials. In the third block, *good*-related words or *American*-related stimuli were paired on the left key, and *bad*-related words or *Foreign*-related words were on the right key for a total of 60 trials. The fourth block entailed a relearning of the *Foreign* and *American* pairing. For 30 trials, Foreig*n* was paired on the left key and *American* was paired on the right key. In the fifth block, *Foreign*-related stimuli or *good*-related words were on the left key, and *American*-related stimuli or *bad*-related words were on the right key for 60 trials. Target words and pictorial stimuli in the American-Foreign IAT were identical to those used in the American and Foreign SC-IATs.

Consistent with Greenwald, Nosek, and Banaji (2003), scores on the IAT were calculated via a D-score algorithm (i.e., comparing stages 3 and 5), with higher scores indicating higher associations of *good* with *American* and *bad* with *Foreign*. The American-Foreign IAT was found to have poor reliability, with Cronbach's $\alpha = .46$.

Mortality Salience Manipulation and Control Condition. In the mortality salience condition, participants were asked to complete the following two standard MS questions: 'Please briefly describe the emotions that the thought of your own death arouses in you' and 'Jot down, as specifically as you can, what you think will happen to you as you

physically die and once you are physically dead' (Sowards et al., 1991). Following this, participants were exposed to a distracter task that lasted approximately 3 minutes (i.e., completing a crossword puzzle) (Greenberg et al., 1994). Participants in the control condition answered questions regarding dental pain (i.e., 'Please briefly describe the emotions that the thought of dental pain arouses in you' and 'Jot down, as specifically as you can, what you think will happen to you as you physically experience dental pain and once you have physically experienced dental pain.'). This control condition has been commonly used and has yielded results similar to those of neutral control conditions (Greenberg et al., 1997). Participants in the control condition also completed the same distracter task as the mortality salience condition following the dental pain manipulation (i.e., crossword puzzle). A review of participants' responses revealed that all completed and answered the questions as the instructions indicated.

Pro and anti-American essays. Commonly used in TMT paradigms and derived from Greenberg, Simon, Pyszczynski, Solomon, and Chatel (1992), the pro and anti-American essays were purportedly written by a non-American and were designed to either threaten the cultural worldview (anti-American condition) or defend the cultural worldview (pro-American condition) (see Appendix C).

Interpersonal Judgment Scale (IJS). The IJS measured attraction toward the authors of the pro and anti-American essays (Byrne, 1971). It is composed of 6 items, which asked the extent to which participants thought the target was intelligent, well-adjusted, moral, knowledgeable of current events, likeable, and desirable as a work partner. Responses were made on a 7-point rating scale. In line with previous terror management research, a composite measure of attraction was obtained by summing the 6

items with ratings that range from 6 (extremely negative) to 42 (extremely positive)

(Greenberg et al., 1990; 1992). The split-half reliability of the attraction measure is .85

(Byrne & Nelson, 1965). It also correlates with other measures of attraction (Lindzey &

Byrne, 1968) and is predictive of behavioral measures of attraction (Byrne, Ervin, &

Lamberth, 1970). In Study 1, this measure displayed low-medium reliability, with

Cronbach's α = .73.

Evaluation questionnaire. Participants indicated their agreement or lack thereof

on a 9-point Likert scale (with 1 = not at all and 9 = totally) with the views expressed in

the essay that was either anti or pro-American in tone, which was a measure of

worldview defense (Greenberg et al., 1992). The questionnaire consisted of 5 items (see

Appendix D). This measure displayed high internal consistency, with Cronbach's α =

.90.

Trait Ratings. These were ratings of the authors of the anti and pro-American

essays, and constituted a measure of the distal defense of patriotism. Ratings were on a

scale of 1 to 9, with 1=not at all applicable and 9=extremely applicable. Participants

rated the authors on positive traits (honest, flexible, likable, intelligent, reliable, tolerant,

stable, knowledgeable, rational, kind, patient, patriotic, warm, generous, and logical) and

negative traits (rigid, arrogant, insensitive, argumentative, snobbish, obnoxious, soft-

headed, weak-minded, and hypocritical, contemptible, and ungrateful) (Simon et al.,

1997). Negative traits were reverse-coded and a composite average score was obtained

ranging from 1 (extremely unfavorable) to 9 (extremely favorable) (Greenberg et al.,

1992). This measure displayed high internal consistency, with Cronbach's α = .91.

Results

Due to error rates of 20% or higher on any one of the implicit measures, one participant was excluded from the analysis. Also, because of an error in the experimental procedure committed by a research assistant, an additional 3 participants were excluded, thus leaving a total sample 133 participants retained for analysis (86 women and 47 men).

Indirect Measures. The American SC-IAT (M = .19, SD = .30) and American-Foreign IAT (M = .54, SD = .41) indirect measures indicated that people were pro-American, and both measures were significantly above zero, t (132) = 7.21, p < .01, d = .62 and t (132) = 15.72, p < .01, d = 1.32. The Foreign SC-IAT (M = -.01, SD = .29) did not yield a significant association, t (132) = -.44, p = .66, d = -.05. The SC-IATs suggest that pro-American associations and not anti-Foreign associations are driving the effect in the American-Foreign IAT.

Next, a correlation analysis was conducted to examine whether or not indirect measures were correlated with one another. As can be seen in Table 1, none of the indirect measures significantly correlated with one another.

Table 1. Correlations Between Indirect Measures

Scale	American SC-IAT	Foreign SC-IAT	American-Foreign IAT
American SC-IAT			
Foreign SC-IAT	r = -.03, p = .71		
American-Foreign IAT	r = .10, p = .28	r = -.09, p = .32	

This is not surprising given the American-Foreign IAT displayed a lower reliability than both the American SC-IAT and Foreign SC-IAT. Further, the lack of a relationship between the Foreign SC-IAT and both the American SC-IAT and American-Foreign IAT is understandable given it appears that implicit attitudes toward Americans were driven by attitudes toward Americans and not by attitudes toward foreigners. Specifically, the Foreign SC-IAT did not show any significant associations while the American SC-IAT did, which potentially explains the significant associations found with the American-Foreign IAT being driven by pro-American implicit attitudes and not necessarily anti-Foreign implicit attitudes. In order to better understand the driving effects of the American-Foreign IAT and to render the IAT more adequately comparable to the SC-IATs, a subsequent correlation analysis was conducted between the American-Foreign IAT and the combined difference between the American SC-IAT and Foreign SC-IAT (this combined difference measure more closely resembles the IAT than either SC-IAT alone does). The American-Foreign IAT and combined difference SC-IAT were not significantly correlated, $r = .12, p = .15$.

MS Effects (ANOVA analyses). One goal of Study 1 was to replicate prior TMT research and demonstrate that the MS group would show significant relationships with the dependent variables measuring the distal worldview defense (i.e., the IJS, evaluation questionnaire, and trait ratings), and the control group would not yield significant relationships with the dependent variables measuring the distal worldview defense. Specifically, the MS group was expected to show more liking for the author of the pro-American essay relative to the control group. Further, the MS group was expected to

show significantly less liking for the author of the anti-American essay relative to the control group.

In order to test whether MS participants displayed a distal defense in comparison to the control group, 2 (mortality salient vs. control) x 2 (pro-American target vs. anti-American target) ANOVAs were conducted. Three ANOVAs were performed on IJS scores, on the Evaluation Questionnaire, and Trait Ratings of the target author.

A 2 (mortality salient vs. control) x 2 (pro-American target vs. anti-American target) ANOVA with the IJS as the dependent variable was performed. A significant main effect of essay condition (i.e., pro vs. anti-American) was found, $F(1, 133) = 22.22$, $p < .01$, but no significant main effect for the MS condition was found, $F(1, 133) = .48$, $p = .49$. This analysis did not reveal a significant interaction effect of mortality salience on IJS ratings of the target author, $F(1, 133) = 1.78$, $p = .18$. Given the IJS was not a successful measure in the detection of an MS effect and the effects were in the opposite direction, it will not be included in subsequent analyses.

A 2 (mortality salient vs. control) x 2 (pro-American target vs. anti-American target) ANOVA with the Evaluation Questionnaire as the dependent variable was performed. A significant main effect of essay condition (i.e., pro vs. anti-American) was found, $F(1, 133) = 28.10$, $p < .01$, but no significant main effect for the MS condition was found, $F(1, 133) = 1.03$, $p = .31$. This analysis did not reveal a significant interaction effect of mortality salience on ratings on the Evaluation Questionnaire of the target author, $F(1, 133) = 1.47$, $p = .23$.

A 2 (mortality salient vs. control) x 2 (pro-American target vs. anti-American target) ANOVA with Trait Ratings as the dependent variable was performed. A

significant main effect of essay condition (i.e., pro vs. anti-American) was found, F (1, 133) = 116.97, $p < .01$, but no significant main effect for the MS condition was found, F (1, 133) = .56, $p = .45$. This analysis did reveal a significant interaction effect of mortality salience on ratings on the Trait Ratings measure of the target author, F (1, 133) = 5.04, $p < .05$.

Next, the means for the four conditions across the dependent variables were examined (Table 2). As can be seen in Table 2, the means for the four conditions were in the opposite, unpredicted direction for the IJS, however, none of these trends were significant. Mean ratings across conditions in the Evaluation Questionnaire were in the predicted direction. However, a test of the ratings of the target author among participants in the MS-pro-American condition compared to control-pro-American participants were not significant, t (129) = 1.62, $p = .11$, $d = .38$. Further, a test of the ratings of the target author among participants in the MS-anti-American condition compared to the control-anti-American condition were also not significant, t (129) = .10, $p = .92$, $d = .03$. Finally, mean ratings across conditions on the Trait Ratings measure were in the predicted direction. Specifically, participants in the MS-pro-American condition showed significantly higher ratings of the target author than control-pro-American participants, t (129) = 2.07, $p < .05$, $d = .52$. A comparison of the ratings among participants in the MS-anti-American and participants in the control-anti-American condition, however, was not significant, t (129) = 1.09, $p = .28$, $d = -.26$. Therefore, only the MS-pro-American condition significantly differed from the control-pro-American condition on the Trait Ratings measure.

Because the results were largely unsuccessful among the dependent measures

Table 2. Mean Ratings on IJS, Evaluation Questionnaire, and Trait Ratings

<div style="text-align:center">IJS</div>

Condition	Anti-American target		Pro-American target	
	Mean	Standard deviation	Mean	Standard deviation
Control	3.03	.65	3.75	.76
MS	3.27	.75	3.68	.59

<div style="text-align:center">Evaluation Questionnaire</div>

	Mean	Standard deviation	Mean	Standard deviation
Control	5.26	1.40	6.27	1.46
MS	5.21	1.60	6.82	1.22

<div style="text-align:center">Trait Ratings</div>

	Mean	Standard deviation	Mean	Standard deviation
Control	5.15	.70	6.33	.94
MS	4.95	.77	6.74	.71

 (i.e., the IJS, Evaluation Questionnaire, and Trait Ratings) individually, they were combined into one scale to test the possibility that the combined scale could yield significant results. A test of correlation analyses between the dependent variables was first conducted to ensure they were related. As shown in Table 3, all dependent variables were significantly related to one another, all ps < .01.

Table 3. Correlations Between Dependent Measures

Scale	IJS	Trait Ratings	Evaluation Questionnaire
IJS			
Trait Ratings	$r = .56*$		
Evaluation Questionnaire	$r = .58*$	$r = .63*$	

*p < .01

To create the combined dependent measures scale, the dependent measures were converted to z scores and then averaged. The combined dependent measures scale displayed low-medium reliability, with Cronbach's α = .77.

 A 2 (mortality salient vs. control) x 2 (pro-American target vs. anti-American target) ANOVA with the combined dependent measures scale as the dependent variable was performed. This analysis did not reveal a significant interaction effect of mortality salience on ratings on the combined dependent measures scale measure of the target author, $F (1, 133) = .50, p < .48$. A significant main effect of essay condition (i.e., pro vs. anti-American) was found, $F (1, 133) = 66.08, p < .01$, but no significant main effect for the MS condition was found, $F (1, 133) = 1.02, p = .32$.

Predictive Ability of Indirect Measures: IAT. The primary goal of Study 1 was to demonstrate the predictive ability of indirect measures of the occurrence and strength of distal defenses among participants in the MS group. Hence, correlation analyses were conducted among indirect measures and dependent measures of the distal defense (Again, the IJS was not included in the analysis due to the lack of effects for this measure).

Contrary to prediction, Table 4 shows that the IAT was not significantly correlated with the Evaluation Questionnaire for participants in both MS conditions (i.e., pro- and anti-American essay conditions). The IAT was also not significantly correlated with the Trait Ratings measure among MS/pro-American essay participants, but was significantly negatively correlated with the Trait Ratings scale among MS/anti-American essay participants as predicted (Table 4). That is, stronger associations between *American* with *Good* and *Foreign* with *Bad* were significantly associated with negative trait ratings of the author of an anti-American essay among MS/anti-American participants.

Contrary to prediction, the IAT was significantly negatively correlated with the Evaluation Questionnaire among participants in the control/anti-American essay participants (Table 4). Specifically, stronger associations between *American* with *Good* and *Foreign* with *Bad* was significantly associated with negative ratings on the Evaluation Questionnaire of the author of an anti-American essay among control participants. The IAT was not significantly correlated, however, with the Evaluation Questionnaire among control/pro-American participants. Table 4 also shows that the IAT was not significantly correlated with the Trait Ratings measure among all control participants (i.e., pro- and anti-American essay conditions).

Table 4. Correlations Between American-Foreign IAT and Dependent Measures of Distal Defense

		Indirect Measure IAT		
Condition	MS/Pro-American Essay	MS/Anti-American Essay	Control/Pro-American Essay	Control/Anti-American Essay
Explicit Measures				
Evaluation Questionnaire	$r = .08, p = .66$	$r = -.33, p = .06$	$r = -.06, p = .74$	$r = -.48**, p < .01$
Trait Ratings	$r = -.14, p = .42$	$r = -.38*, p = .03$	$r = -.06, p = .76$	$r = .06, p = .73$

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

In order to examine differences between the different conditions, Fisher's r to z test of independent samples calculations were performed. First, the MS/pro-American and control/pro-American conditions were compared on the Evaluation Questionnaire and Trait Ratings measure and were not significantly different, $z = .55$, $p = .58$ and $z = -.32$, $p = .75$, respectively. Thus, the IAT was unsuccessful in differentially predicting the responses of MS/pro-American from the control/pro-American condition on both the Evaluation Questionnaire and Trait Ratings measures. Finally, the MS/anti-American and control/anti-American conditions were compared on the Evaluation Questionnaire and the Trait Ratings measure and were not significantly different, $z = .70$, $p = .48$ and $z = -1.78$, $p = .07$, respectively. Thus, the IAT was also unsuccessful in differentially predicting the responses of MS/anti-American from the control/anti-American condition on both the Evaluation Questionnaire and Trait Ratings measures.

American and Foreign SC-IATs. Contrary to prediction, Table 5 shows that the correlations between the American SC-IAT and dependent measures were not significant among both MS/pro-American essay and MS/anti-American essay participants. Table 5 also shows that the American SC-IAT was not significantly related to any dependent variables among participants in the control conditions (both pro- and anti-American essay conditions).

The Foreign SC-IAT was expected to positively correlate with the Evaluation Questionnaire and Trait Ratings measures among MS/anti-American essay participants, but this was not the case (see Table 5). Table 5 shows that none of the correlations between the Foreign SC-IAT and the dependent variables for MS/pro- and anti-American essay conditions were significant. Finally, as expected, the Foreign SC-IAT was not

Table 5. Correlations Between SC-IATs and Dependent Measures

Indirect Measures	American SC-IAT		Foreign SC-IAT	
Condition	MS/Pro-American Essay	MS/Anti-American Essay	MS/Pro-American Essay	MS/Anti-American Essay
Explicit Measures				
Evaluation Questionnaire	$r = .21, p = .22$	$r = .16, p = .39$	$r = .17, p = .34$	$r = -.08, p = .68$
Trait Ratings	$r = .10, p = .57$	$r = .05, p = .77$	$r = .16, p = .36$	$r = .13, p = .47$
Condition	Control/Pro-American Essay	Control/Anti-American Essay	Control/Pro-American Essay	Control/Anti-American Essay
Evaluation Questionnaire	$r = .07, p = .70$	$r = .05, p = .79$	$r = .16, p = .38$	$r = -.27, p = .12$
Trait Ratings	$r = .19, p = .29$	$r = .17, p = .35$	$r = .23, p = .19$	$r = -.08, p = .67$

significantly correlated with any of the dependent variables among participants in the control/pro- and anti-American essay conditions.

Discussion

The hypotheses of Study 1 were unconfirmed. In a deviation from the literature of terror management theory, the patriotic worldview defensive reaction was largely absent following a mortality salience reminder. Of all the manipulations, only one dependent measure (i.e., Trait Ratings) detected the predicted defensive reaction among only participants in the MS/pro-American condition, which significantly differed from the control/pro-American condition. Given these unexpected null results, testing the ability of indirect measures to predict the strength of the worldview defensive reaction of patriotism among MS participants was not feasible.

The larger question emerges, however, as to why the defensive reactions did not arise in response to a mortality salience manipulation despite the extensive literature documenting the patriotic defense as a robust effect. It could be the case that although the patriotic defense mechanism appears to be a robust effect, there may be hitherto unknown factors involved in the appearance or lack of appearance of the defense in response to a mortality salience manipulation. For example, the dual defense theory of proximal and distal defenses is a post-hoc addition to TMT, which was added to explain findings that were puzzling and contradictory reactions to mortality salience manipulations (Leary, 2004). In light of the infancy of TMT and the modifications still being made to the theory, perhaps there are certain conditions that thwart or enhance the instigation of defense mechanisms that still need to be enumerated. Critics of TMT cite two main assumptions of TMT that cast doubt on the empirical veracity of the theory and

point to the further refinements still needed to strengthen the theory (As a side, it should be noted that most critics of TMT agree with the logical implications of TMT, but take issue with the empirical foundation, or lack thereof, on which the theory rests).

The first assumption of TMT that critics take issue with is that awareness of mortality/inevitability of death results in the potential for a paralyzing terror that makes goal-directed behavior impossible (Pyszczynski, Greenberg, & Solomon, 1997). Critics argue that not only is there no empirical evidence that death awareness results in behavioral paralysis, but they also contend that an equally viable assumption would be that death awareness results in an increased motivation to engage in meaningful, goal-directed behaviors (Leary, 2004). Because this is an untested assumption, it is not known, for example, if there is individual variation in the severity of behavioral paralysis in the event this is a consequence of death awareness. Further, to the extent that a form of behavioral paralysis is experienced prior to the instigation of a defense mechanism as terror management theorists claim (which, again, has not been empirically verified), the effects of this short-lived paralysis on defense mechanisms is unknown. Perhaps it has no effect on defense mechanisms, some effect on defense mechanisms, some effect on only particular defense mechanisms, or is a causal or mediating factor in the instigation of defense mechanisms. Until empirical evidence is garnered, no strong claims can be made.

Critics also take issue with a second assumption of TMT based on evolutionary theory. Specifically, TMT proponents claim that defense mechanisms evolved as adaptations because they lessened the debilitating fear of death that emerged with self-awareness. One counterargument is that the emergence of defense mechanisms

compromise survival, not enhance it, given defense mechanisms make individuals less afraid of death (Leary, 2004). Further, critics question why a debilitating terror of death would have evolved given evolution would select out those whose survival was compromised by such a debilitating fear (Leary).

TMT enthusiasts have yet to provide an adequate evolutionary explanation for the evolution of the debilitating fear of death in tandem with self-awareness and the evolution of defense mechanisms to deal with such fears. Nonetheless, the emergence of defense mechanisms does appear to be a robust phenomenon. The evolutionary contention with TMT lies more in the domain of *why* defense mechanisms appear in response to mortality salience manipulations than *if* they arise in response to mortality salience manipulations. However, an explanation as to *why* defense mechanisms evolved has the potential to broaden the understanding of the nature of defense mechanisms (e.g., other circumstances in which defense mechanisms may or may not arise, the strength of defense mechanisms in response to various circumstances, etc.).

Assuming the patriotic defense mechanism did arise in accordance with prediction and TMT literature, there is reason to suspect that indirect measures could provide unique insights in the domain of prediction specifically. In a recent, novel study involving consumption of foreign and domestic chocolates following a mortality salience manipulation, researchers found participants consumed more domestic chocolate than foreign chocolate in the MS condition, but not the control condition, which is in line with the worldview defense supposition (Friese & Hoffman, 2008). Further, these researchers also found that mortality salience participants exhibited depleted self-regulatory resources (Friese & Hoffman). Mortality salience inductions cause individuals to

suppress death-related thoughts (Greenberg et al., 1994), which, some researchers claim, is an act that relies on self-regulatory resources that are limited (Gailliot, Schmeichel, & Baumeister, 2006). Previous research has indicated that mortality salience inductions interfered with and impaired self-regulatory responses on tasks such as solving anagrams, analytical reasoning, and the Stroop task, which are all tasks unrelated to death (Gailliot et al.). The finding that an SC-IAT successfully predicted total chocolate consumption among MS participants but not control participants makes sense when scarce self-regulatory resources are considered as a byproduct of the MS manipulation, thus leading to lower control and more impulsive processes guiding behavior (Friese & Hoffman).

It is important to note that the SC-IAT predicted only total consumption of chocolate among only MS participants and not increased consumption of domestic chocolate (i.e., the worldview defense). That is, the SC-IAT was not able to predict the worldview defense specifically (i.e., increased consumption of domestic chocolate among MS participants), but was able to predict the byproduct effect of mortality salience in terms of depleted self-regulatory processes; i.e., total chocolate consumption among MS participants. This makes sense given indirect measures like the SC-IAT are thought to capture spontaneous behaviors and given total consumption of chocolates due to depleted self-regulation is also considered a spontaneous behavior (Friese & Hoffman, 2008). Again, because the nature of defense mechanisms is not fully understood, it would be erroneous to claim that all defense mechanisms are either completely divorced from or connected to depleted self-regulatory processes. This may complicate how indirect measures are effectively implemented in the TMT paradigm. Further, whether or not indirect measures are predicting defense mechanisms in response to mortality salience or

are categorizing defense mechanisms into regulatory versus nonregulatory reactions due to depleted resources remains an open question.

It could be that despite TMT proponents' claims that a distal defense like patriotism is reflexive, there may be a degree of reflection involved, which would have rendered indirect measures useless in the prediction of its occurrence. Equally plausible is the notion that diminished self-regulatory resources play a role in the instigation of the distal defense of patriotism, which would have made indirect measures amenable to predicting this defense. The current study was unsuccessful in uncovering the nature of the specific defense of patriotism, but indirect measures do hold potential value in further illuminating the characteristics of defense mechanisms and processes underlying the instigation of defense mechanisms given there appears to be a component of spontaneous behaviors in at least some defenses.

CHAPTER 3
STUDY 2

TMT posits that the function of self-esteem is to buffer anxiety that results from our awareness of death (Greenberg et al., 1986). Although one of the main postulated defenses of TMT is the bolstering of self-esteem, the few early studies failed to find any effects of mortality salience on self-esteem when self-esteem was measured as a dependent variable (personal correspondence with Koole; Sowards et al., 1991). Typically, therefore, most TMT studies involving self-esteem measure adherence to cultural standards important to the individual (via direct measures) as an indirect measure of self-esteem (Pyszczynski, Greenberg, Solomon, Arndt, & Schimel, 2004). The question as to whether or not self-esteem is initially lowered or bolstered in response to mortality salience manipulations remains open. The goal of Study 2 is to investigate the effects of mortality salience on implicit self-esteem via indirect measures and direct measures.

The effects of mortality salience on implicit self-esteem should be investigated via the incorporation of indirect measures in TMT research, especially given the fact that implicit cognition (i.e., implicit self-esteem) is thought to be effective in threat detection (Conner & Barrett, 2005), is susceptible to fluctuations as a result of changes in the immediate environment (Pelham & Hetts, 1999), and is automatic and nonconscious (Greenwald & Banajii, 1995). Further, there is evidence for automatic affective reactions within terror management paradigms that are revealed only via indirect measures, not direct measures (Arndt et al., 2001; DeWall & Baumeister, 2007). Implicit self-esteem is generally defined as the automatic aspect of self-esteem that is nonconscious, which entails an unintentional self-evaluation that often lies outside of awareness (Greenwald &

Banaji, 1995; Farnham, Greenwald, & Banaji, 1999). Given implicit self-esteem is outside of conscious awareness, direct measurement of self-esteem is not possible. Instead, implicit self-esteem is examined indirectly typically via introspectively inaccessible, automatic associations with the self (i.e., the IAT and SC-IAT).

Implicit self-esteem has been characterized as resilient and 'rubbery' while also being durable (Koole, Dijksterhuis, & van Knippenberg, 2001). These researchers suggest that implicit self-esteem can be affected by immediate changes in the environment, but will return to original levels when environmental pressures are removed. In a study where half of the participants received subliminal positive self-conditioning and the other half received no self-conditioning, the subliminal, positive self-conditioning procedure did boost implicit self-esteem, which, in turn, changed participants' affective state as well (explicit self-esteem was not measured in this study) (Dijksterhuis, 2004). The temporary boost to implicit self-esteem also minimized unpleasant feelings after negative performance feedback. Finally, in another study demonstrating the fluctuating nature of implicit self-esteem, researchers have found that implicit self-esteem was lowered after participants received failure feedback following a bogus intelligence test (Koole, Smeets, van Knippenberg, & Dijksterhuis, 1999). Further, implicit self-esteem was raised after participants were given the opportunity to affirm a personally important value (explicit self-esteem was not measured in this study either).

As previously mentioned, the majority of previous attempts to find affective reactions to mortality salience manipulations have been unsuccessful (Pyszczynski et al., 1999). One study, however, has demonstrated that participants display a preference for emotionally positive, pleasant information and associations via a word-stem completion

task immediately following a mortality salience manipulation (without a delay) (DeWall & Baumeister, 2007). In line with previous research, these researchers did not find changes in negative emotion via direct measurement. They conclude that there is an automatic coping process instigated immediately following a mortality salience manipulation, which is in accord with the notion that the psychological immune system is automatically activated in response to a trauma or threat (see Gilbert, Pinel, Wilson, Blumberg, & Wheatley, 1998). Given the evidence that an automatic coping process is instigated following an MS manipulation, it is hypothesized that self-esteem bolstering following a mortality salience condition is automatic, and indirect measures of implicit self-esteem are expected to reflect this shift. Specifically, it is hypothesized that implicit self-esteem will be higher among participants in the mortality salient condition compared to the control condition. Although previous attempts to demonstrate the distal defense of self-esteem bolstering have been unsuccessful via direct measurement, perhaps a reliable, direct measure of state self-esteem will capture a change in self-esteem as a result of a mortality salience manipulation. It is therefore hypothesized that a direct measure of state self-esteem will also reveal changes following a mortality salience manipulation.

<div align="center">Method</div>

Design

Study 2 employed a between-subjects two-by-two design, investigating the effects of mortality salience on self-esteem. Participants were randomly assigned to either an MS condition or control condition, and subsequently completed either an indirect self-esteem measure followed by an explicit self-esteem measure or an explicit self-esteem measure followed by an indirect measure of self-esteem.

Participants

Data were collected from 240 undergraduate university students, but due to procedural errors and errors rates of 20% or higher on the implicit measure of self-esteem, 27 participants were removed leaving 213 participants retained for analysis (53 men and 160 women). Participants were between the ages of 18 and 54, with a mean age = 20 years. The study was conducted at Temple University, a large, urban university in the northeast section of the country. The majority of the sample used in the present study was Caucasian (51%), followed by Blacks (22%), Asians (17%), Hispanics (5%), and 5% identified as "other." Participants volunteered to participate as part of course credit for an introductory psychology course, and were fully debriefed upon completing the study.

Overview of Procedure

There were two conditions: a mortality salience condition (MS condition) whereby participants were instructed to write about their own mortality and a control condition whereby participants were instructed to write about dental pain. Next, all participants first completed either an indirect measure of self-esteem, the self-esteem SC-IAT, or a direct measure of self-esteem, the Rosenberg self-esteem scale (these measures were counterbalanced).

Procedure

Participants were run in a group of up to 4 individuals and all data were collected via desktop computers. Upon entering the lab, participants were greeted by the experimenter and subsequently read and sign informed consent forms. After the collection of consent forms, participants were given numbers for identification to ensure anonymity. Participants first reported demographic characteristics about themselves (i.e.,

gender, ethnicity, and age), which was followed by either the mortality salience manipulation or control instructions. Next, either the self-esteem SC-IAT or a modified version of the Rosenberg self-esteem scale designed to capture state self-esteem (see Niiya, Crocker, & Bartmess, 2004) was completed (these measures were counterbalanced). The duration of the experiment was approximately 1 hour.

Measures

Mortality Salience Manipulation and Control Condition. The MS manipulation and control condition were identical to that of Study 1 except for the fact that there was no delay/distraction task (i.e., crossword puzzle).

Self-esteem SC-IAT. The procedure for the SC-IAT was identical to that of Study 1 except that a self-esteem SC-IAT measured the ease with which participants associated *self* with *good* versus *self* with *bad*. The target words were *beautiful, celebrating, cheerful, excellent, excitement, fabulous, friendly, glad, happy, joyful, laughing, loving, marvelous, pleasure, smiling, splendid, superb, paradise, terrific, triumph,* and *wonderful* for the category label *good*, and *brutal, destroy, dirty, disaster, disgusting, dislike, evil, gross, hate, horrible, humiliate, nasty, noxious, painful, revolting, sickening, terrible, tragic, ugly, unpleasant,* and *yucky* for the category label *bad*. Finally, for the *self* category, the target words were: *me*, *myself*, and the first and last name of the participant.

Consistent with Karpinski and Steinman (2006), SC-IAT scores were computed via a D-score algorithm, with higher scores indicating greater associations of *self* with *good* than *self* with *bad*. The Self-Esteem SC-IAT displayed high internal consistency, with Cronbach's α = .75.

Rosenberg Self-Esteem Scale. The scale that was used in the present study is a modified version of the Rosenberg self-esteem scale (1965) where the words 'right now' were added to the beginning of each item in order to capture state self-esteem (see Niiya, Crocker, & Bartmess, 2004). It consisted of 10 items related to self-worth or acceptance, and items were answered on a 4-point scale ranging from strongly agree to strongly disagree. Positively phrased items were reversed scored, and higher scores indicated higher self-esteem. Example items include, 'Right now, I think I am no good at all,' 'Right now, I wish I could have more respect for myself,' and 'Right now, I am inclined to feel that I am a failure.' This measure displayed high internal consistency, with Cronbach's α = .89.

Results

Self-Esteem SC-IAT. The Self-Esteem SC-IAT (M = .41, SD = .35) indicated that people associated *self* with *good* more so than *self* with *bad*, and this association was significantly above zero, t (212) = 16.84, $p < .01$, d = 1.17. The Rosenberg Self-Esteem Scale (M = 3.29, SD = .47) indicated that people had high explicit, state self-esteem and this was significantly above the midpoint of the scale, t (212) = 24.68, $p < .01$, d = 1.68. A correlation analysis between the indirect (i.e., self-esteem SC-IAT) and direct measure of self-esteem (i.e., Rosenberg Self-Esteem Scale) was conducted to determine whether or not they were measuring different aspects of self-esteem. The measures were not significantly correlated with one another, r = .07, p = .30.

ANOVA Analyses. The primary goal of Study 2 was to investigate the bolstering of self-esteem among participants in the MS group via indirect and direct measurement of self-esteem.

To test the hypothesis that implicit self-esteem was bolstered following a mortality salience manipulation, a 2 (mortality salient vs. control) x 2 (Self-Esteem SC-IAT first vs. Rosenberg Self-Esteem first) ANOVA with the Self-Esteem SC-IAT as the dependent variable was performed. The analysis did not yield a significant main effect of mortality salience, $F(1, 213) = .01$, $p = .95$, nor was there a significant main effect for the order of the completion of the self-esteem measures (i.e., indirect first vs. direct first), $F(1, 213) = .05$, $p = .83$. This analysis also did not reveal a significant interaction effect of mortality salience and order of measures on ratings on the Self-Esteem SC-IAT, $F(1, 213) = .57$, $p = .45$. Mean ratings across conditions were nearly identical and not in the predicted direction (see Table 6).

Table 6. Mean Ratings on Self-Esteem SC-IAT and the Rosenberg Self-Esteem Scale

	Self-Esteem SC-IAT			
Condition	SC-IAT first		Rosenberg Self-Esteem first	
	Mean	Standard deviation	Mean	Standard deviation
Control	.42	.05	.39	.05
MS	.39	.05	.43	.05
	Rosenberg Self-Esteem Scale			
	Mean	Standard deviation	Mean	Standard deviation
Control	3.27	.49	3.32	.43
MS	3.27	.51	3.35	.47

Next, a 2 (mortality salient vs. control) x 2 (indirect measure first vs. direct measure first) between-subjects ANOVA was conducted on the Rosenberg Self-Esteem Scale to test the hypothesis that state self-esteem was automatically bolstered following a MS manipulation. The analysis did not yield a significant main effect of mortality salience, $F(1, 213) = .03$, $p = .85$, nor was there a significant main effect for the order of the completion of the self-esteem measures (i.e., indirect first vs. direct first), $F(1, 213) = .86$, $p = .36$. This analysis also did not reveal a significant interaction effect of mortality salience and order of measures on ratings on the Rosenberg Self-Esteem Scale, $F(1, 213) = .07$, $p = .80$. Mean ratings across conditions were nearly identical and not in the predicted direction (see Table 6).

The analyses of Study 2 did not reveal implicit or state self-esteem bolstering among MS participants in comparison to control participants in either condition (i.e., indirect self-esteem measure first vs. direct self-esteem measure first).

<div align="center">Discussion</div>

The hypotheses that self-esteem bolstering would be captured by indirect and direct measures of implicit and state self-esteem respectively immediately following a MS manipulation were unconfirmed. There are a number of potential explanations for the lack of significant results, which will be enumerated in this section.

First, like Study 1, it could be that the effects of mortality salience, as expected from a TMT vantage point, never arose. Because the goal was to ascertain the immediate effects of MS manipulations on self-esteem, the design of Study 2 prohibited a manipulation check on the effectiveness of the MS manipulations. Therefore, whether or not these measures of self-esteem were capable of detecting differences between MS and

control instructions is unclear. It should be noted, however, that this method of MS

manipulation has been successful in several previous studies and is the standard method

by which death-related thoughts are made salient in the TMT paradigm (Rosenblatt et al.,

1989; Sowards et al., 1991; Greenberg et al., 1994; DeWall & Baumeister, 2007).

If MS effects were present, however, explanations for the lack of detection among

the self-esteem measures are needed. One potential explanation for the lack of results

with the direct measure of state self-esteem via the Rosenberg Self-Esteem Scale (RSE)

has to do with the nature of explicit self-esteem. Specifically, explicit self-esteem

measures may be measuring only what is very ingrained in terms of how individuals

think of themselves. Evidence for the notion that explicit self-esteem is ingrained comes

from the fact that single-item measures of explicit self-esteem correlate very strongly

with multi-item measures like the RSE (Robins, Hendin, & Trzesniewski, 2001). The

Single-Item Self-Esteem Scale (SISE), for example, consists of only one item, 'I have

high self-esteem' (which is rated on a 5-point scale ranging from 1 = *not very true of me*

to 5 = *very true of me*), and was found to be as strongly correlated as $r = .97$ with the

RSE (Robins et al.). Although a modified, state version of the RSE was used in the

present study, the notion that this measure is tapping into a broad, global assessment of

self-esteem holds true. It could be that only certain components of self-esteem are

affected by MS manipulations (not overall, global self-esteem), which would render the

current results more explicable.

Keeping the global nature of the RSE in mind, it would perhaps prove beneficial

to include a self-esteem measure that is not only context-dependent and state-like, but

also less global so that participants do not rely on this ingrained notion of themselves

when completing direct self-esteem measures in TMT paradigms. This, however, brings the construct of self-esteem bolstering in the TMT paradigm back into question. If global self-esteem is not affected by MS manipulations, which aspects of self-esteem are affected? TMT researchers have largely failed to find effects of MS on self-esteem directly. Instead, within the TMT paradigm, self-esteem is operationalized via a contingency of self-worth model (see Crocker & Wolfe, 2001). This is a reasonable course of action, but it is also passive acknowledgment that global self-esteem appears to be largely unaffected by MS manipulations. The current study appears to fall in line with previous unsuccessful attempts within the TMT literature to find direct effects of MS manipulations on self-esteem. Future research should concentrate on the implementation of a self-esteem measure that unearths effects of self-esteem bolstering across individuals in response to MS manipulations in order to strengthen the self-esteem construct in the TMT paradigm.

Next, an explanation for the lack of effects with the indirect measure of self-esteem is required. Of the existing indirect measures of self-esteem, the SC-IAT seemed an ideal measure to use because, like the IAT, it is malleable in various contexts (see Castelli & Tomelleri, 2008; Govan & Williams, 2004), and unlike the IAT, it is less susceptible to contamination (see Karpinski, 2004; Karpinski & Steinman, 2006). The self-esteem SC-IAT measures good and bad associations with the self, and it could be that mortality salience manipulations do not move these associations around as much as initially suspected despite the malleable nature of the measure. The self-esteem SC-IAT, in particular, has demonstrated significant correlations with explicit measures of self-esteem where other indirect measures of self-esteem have failed to reach significance

(Karpinski & Steinman). One possibility is that the self-esteem SC-IAT is a measurement of trait self-esteem. Specifically, the good and bad associations an individual has with the self may be ingrained and thus reflect an assessment of trait self-esteem, which appears to be unaffected by MS manipulations. If the self-esteem SC-IAT is a measure of trait self-esteem, it would not be an effective measure to test the self-esteem bolstering defense following MS manipulations. Examining trait versus state self-esteem in the TMT paradigm could be a misguided endeavor. That is, it could be that global verses specific self-esteem construals are more affected by MS manipulations, which explains the lack of evidence for the self-esteem bolstering construct when examined from a trait versus state self-esteem perspective. Researchers have demonstrated that the unidimensional conception of implicit self-esteem is misguided, and have teased apart dimensions to reveal a more multifaceted nature of implicit self-esteem via a modified indirect measure (Sakellaropoulo & Baldwin, 2007). Although there has been moderate success with other indirect measures in the TMT paradigm (i.e., physiological measures, Implicit Association Test, etc.; see Arndt et al., 2001; Bassett, 2005; Bassett & Dabbs, 2003), a modified indirect measure of self-esteem that perhaps captures specific construals of implicit self-esteem (as opposed to global self-esteem) is needed to better understand the nature of the self-esteem bolstering defense.

One final potential explanation for the lack of significant results comes from the criticisms revolving around the conception of self-esteem within TMT. That is, if the self-esteem construct postulated by TMT is flawed, there would be little reason to expect results that differ from the ones obtained in the present study. Self-esteem is an old psychological construct, but it is a construct that has yet to be fortunate enough to have

an agreed upon definition/function. According to sociometer theory (Leary, Tambor, Terdal, & Downs, 1995), self-esteem is a gauge of social exclusion, and proponents of this theory argue that the typical TMT findings that cast self-esteem into a defensive posture when mortality is made salient is merely another form of social exclusion (given death connotes exclusion) (Ryan & Deci, 2004). Therefore, TMT does not accurately describe the function of self-esteem, which lends the self-esteem construct as conceptualized by TMT to a second criticism that it is not only unnecessary, but also counterintuitive and problematic (Crocker & Nuer, 2004). First, although bolstering self-esteem may alleviate anxiety, it does not necessitate self-esteem as a psychological structure when other avenues for anxiety reduction exist (Crocker & Nuer). Second, there are several examples where pursuing self-esteem can even be anxiety inducing (e.g., individuals who base their self-worth on academic performance), which would not fit with the TMT anxiety-reducing function of self-esteem (Crocker & Nuer). Finally, there are criticisms from an evolutionary perspective surrounding the self-esteem bolstering construct. The main criticism from an evolutionary perspective is that TMT does not explain how self-esteem could have evolved as a defense mechanism to quell anxieties regarding death (Leary, 2004). The evolution of self-esteem serving the function of alleviating anxieties concerning death is problematic because quelling anxieties stemming from death concerns could potentially be detrimental to survival (Leary).

Although TMT researchers offer theoretical explanations for these previously mentioned qualms with TMT's conception of self-esteem (see Pyszczynski et al., 2004), empirical validations of such explanations are lacking. In fairness, the various theories of

self-esteem each have merit and illuminate some unique facet of the construct. At the very least, it can be stated with reasonable confidence that all theories of self-esteem agree in that self-esteem involves evaluation of the self, a motivation to maintain high self-esteem, and a defense of self-esteem when it is threatened (Pyszczynski, et al.). The current study, however, was unable to provide insights into the self-esteem bolstering construct or whatever unique facets of self-esteem that are revealed by TMT.

CHAPTER 4
GENERAL DISCUSSION

The current paper unsuccessfully attempted to test two models whereby implicit cognitive processes were examined within a TMT paradigm. In Study 1, indirect measures of patriotism were unsuccessful in the prediction of the distal defense of patriotism (however, contrary to expectations, the distal defense did not emerge among MS participants). Study 2 was an attempt to reveal the cognitive processes behind the self-esteem bolstering construct, but the self-esteem SC-IAT was unsuccessful in detecting shifts in implicit self-esteem following an MS manipulation (due to the experimental design, however, it is unclear whether or not the MS manipulation was successful). Whether the models proposed in the current study are flawed and need revision or simply need to be tested again under conditions whereby distal defenses are definitively instigated appears to be unclear, but both possibilities will be examined.

Given indirect measures have been successful in past TMT research (see Bassett & Dabbs, 2003; Bassett, 2005; Arndt et al., 2001), there is reason to suspect that the current proposed models are viable, and need to be retested under conditions where the distal defenses are instigated. There may be missed subtleties in the current study that thwarted the distal defenses from arising among MS participants, and the current models may have proven informative had those subtleties been taken into account. For example, no demographic data was collected on level of religiosity or belief in an afterlife, which have both been suggested as mechanisms that buffer death anxiety and the instigation of death-related defense mechanisms (Sowards et al., 1991). It could be that the current study included a large number of deeply religious participants and/or participants who

held strong beliefs in an afterlife, which made the MS manipulation less effective in instigating distal defenses.

Political orientation or ideology is another factor that has an effect on whether or not a distal defense is instigated in response to MS manipulations (Greenberg et al., 1992). Specifically, liberals in comparison to conservatives were found to respond *more* favorably to those who challenged their own worldview following a MS manipulation (Greenberg et al.). This counterintuitive distal defense among liberals was explained by the notion that liberals were committed to the value of tolerance because it was central to their own worldview and self-esteem (Greenberg et al.). Political ideology was an overlooked factor that was crucial to the success of Study 1 and should have been part of the demographic information collected especially since it is likely that a majority of the sample was liberal (given Temple University is situated in a geographic region of the country that is largely liberal) (Wood, 2007).

Although the TMT paradigm is an established one with robust findings, it would have been beneficial to have gathered pilot data so that the factors that contribute to or thwart the instigation of distal defenses among MS participants could have been determined in advance. Indeed, in addition to the previously mentioned overlooked factors, mode of thought (experiential vs. rational) and age are other factors uncovered that affect the instigation and strength of distal defenses (Simon et al., 1997; Florian & Mikulincer, 1998). Assuming future pilot studies yield distal defenses and an effective test of the current proposed model is possible, there are numerous potential outcomes.

One potential outcome is that indirect measures would successfully predict the instigation of distal defenses as initially hypothesized in Study 1. In a study of death

attitudes, the IAT was successful in predicting behaviors that direct measures of death attitudes were unable to predict (Bassett & Dabbs, 2003). Given implicit and explicit death attitudes have different behavioral implications, there is reason to suspect that there is a possibility that the implicit and explicit cognitive processes following death reminders also have different effects on behaviors, specifically distal defenses.

Distal defenses are conceptualized as nondeliberative, spontaneous reactions to death reminders (see Steffans & Konig, 2006), but there is nothing known regarding the cognitive processes that occur during the delay between the mortality salience manipulation and the instigation of the distal defense. There could be a great deal of implicit processing that influences distal defenses, which would likely lend indirect measures amenable to not only predicting distal defenses (as was the goal in Study 1), but also revealing the effects of MS manipulations on implicit processes at work during the interim between MS manipulations and the instigation of distal defenses (as was the goal in Study 2).

However, given the results of the current study were largely unsuccessful, more explanations for the null results than justifications for the model are warranted. It could be that the SC-IAT and IAT (i.e., reaction-based, indirect measures) were ill-suited to predict distal defenses in Study 1 or detect differences in self-esteem in Study 2. There are several different classes of indirect measures to capture automatic cognitive processes outside of conscious awareness or control (i.e., reaction-time based measures, physiological measures, measures that assess level of abstraction, etc.) (Asendorpf et al., 2002; Fazio & Olsen, 2003). To have successfully studied distal defenses in Study 1 and Study 2 of the current study, there appear to be 2 main characteristics an indirect measure

must possess: 1.) In reference to Study 2 and examining the self-esteem bolstering construct, indirect measures of self-esteem must be indirect as far as not obviously measuring an individual's self-esteem (because this has been unsuccessful in the TMT paradigm), but this measure must be related to some measure of self-esteem in order to provide some insight into the self-esteem bolstering construct, and 2.) In reference to Study 1 and the use of indirect measures as predictive tools, they cannot make death-related thoughts conscious (because only proximal defenses would then arise; see Pyszczynski et al., 1999).

With regard to the need for an indirect measure of self-esteem that has more indirect qualities than direct qualities as far as measuring the self-esteem construct is concerned, it could be that the SC-IAT used in the current study had direct qualities as a measurement of self-esteem, which made it only slightly different from previous failed attempts to study self-esteem directly in the TMT paradigm. For example, it could be argued that participants were aware that the self-esteem SC-IAT was measuring self-esteem given they were making associations of *self* with both *good* and *bad*. Although the self-esteem SC-IAT has an indirect quality by virtue of reaction time being its measure, it also has a direct quality by virtue of not concealing the construct being measured.

One novel way to assess implicit self-esteem in a TMT paradigm in a less direct manner than the SC-IAT would be to present a lineup of each of the participant's faces morphed into varying degrees of attractiveness. Research has shown that individuals more likely recognized their own faces as more attractive than they actually are in such a lineup (Epley, 2008). This enhancement bias was correlated with implicit self-esteem,

but not explicit self-esteem, which is indicative of automatic, spontaneous processes at

work (Epley). This indirect measure of self-esteem could be easily incorporated into a

TMT framework in such a manner that the construct of interest is concealed enough to

potentially capture any effects of MS manipulations on self-esteem. Further, a measure

like this holds promise in a TMT paradigm because it is thought to capture spontaneous

evaluations of the self, which is in line with the nature of distal defenses. Although TMT

research into detecting the effects of mortality salience on self-esteem has been largely

unsuccessful, new, indirect measures of self-esteem that have more indirect qualities and

less direct qualities, which appears to be important in studying the self-esteem bolstering

construct, should be tested in order to better understand the immediate effects of MS

manipulations on self-esteem.

Before addressing the second characteristic required of indirect measures in TMT

research, it should also be noted that experiments involving the examination of the

immediate effects of MS manipulations on self-esteem should be sensitive to time

constraints. One potential flaw in the design of Study 2 was the use of paper-based

materials for the mortality salience manipulation (typically done in TMT research), which

had to be collected before participants completed the self-esteem measures. This gap in

time between the mortality salience manipulation and responding on the self-esteem

measures could have been prevented the detection of any immediate effect of mortality

salience on self-esteem. If the MS and control instructions were computerized and

responses were typed instead of handwritten, participants could move directly to the

computerized self-esteem measure to minimize the time duration between the

manipulation and responding on the self-esteem measure. In future studies of the direct

effect of mortality salience on self-esteem, sensitivity to time constraints should certainly be considered in the procedural methods employed (by limiting the time between the mortality salience manipulation and measurement of self-esteem as much as possible).

With regard to incorporating indirect measures that do not make death-related thoughts conscious, any one of the indirect measures used in Study 1 (i.e., American SC-IAT, Foreign SC-IAT, American-Foreign IAT) could have potentially served as a threat to worldview, which has been demonstrated to increase death-related thoughts (Schimel, Hayes, Williams, & Jahriq, 2007). Across several studies, threats to worldview (e.g., threatening cultural values, challenging ideology regarding evolution vs. creationism, etc.) increased death though accessibility as measured by word-stem completion tasks and lexical decision tasks (Schimel et al.). In both the SC-IAT and IAT employed in Study 1, participants were forced in one of the blocks for each of the measures to associate *American* with *bad* (i.e., the American SC-IAT and the American-Foreign IAT) and/or *Foreign* with *good* (i.e., the Foreign SC-IAT and the American-Foreign IAT). This categorization could have served as a threat to worldview, which would have increased death thought accessibility. Given these measures were completed before the MS manipulation, the threat to worldview via the indirect measures could have thwarted the distal defenses from arising because death-thoughts were highly accessible, and perhaps, conscious even after the delay given death-related thoughts were doubly primed. If this was the case for the current study, it could be that only proximal defenses were engaged (which was not measured).

Future research involving indirect measurement as predictive tools, therefore, should take into account whether or not the indirect measure itself could act as a

worldview threat, which thereby results in increased death thought accessibility. Perhaps an indirect measure (one based on reaction time like the SC-IAT or IAT) that measures something seemingly innocuous (and, therefore, cannot be construed as threatening to worldview), but still bears some relation to a distal defense would be best as a predicting variable of distal defenses. Instead of having participants associate *American* with *bad* and *Foreign* with *good* as was done in the current study, a categorization task where American and foreign-based products are categorized as good or bad, for example, would perhaps be less likely to be construed as a threat to worldview and therefore, may not prevent the instigation of distal defense and may also still be predictive of the worldview defense of patriotism. This is obviously speculative, and future research should explore the various categories that can be employed in reaction-time-based, indirect measures like the SC-IAT and IAT in order to implement them effectively in TMT paradigms.

TMT is a novel, counterintuitive, and shocking experimental paradigm. Most resist the notion that their own attitudes and behaviors are shaped by death concerns simmering at the cusp of consciousness, but the large, robust TMT literature forces the reconsideration of such doubts. The current study was an attempt to uncover the hidden, subconscious processes at work when faced with mortality that make the findings under the TMT paradigm so unbelievable to most individuals. Although unsuccessful in that pursuit, the current study no less points to the complexity of incorporating indirect measures into TMT and highlights the multiple obstacles that need to be addressed in order to incorporate these measures successfully. Keeping factors such as time constraints in mind, future pilot studies with new measures of self-esteem are required in order to truly uncover the effects of mortality salience on self-esteem and accurately

assess the self-esteem bolstering construct. Further, considering the potential role of

indirect measures as worldview threat manipulations, pilot studies with various indirect

measures as predictor variables of distal defenses also need to be conducted. These

considerations brought about by the current study could spell the need for the actual

construction of new, indirect measures tailored specifically for the TMT paradigm. With

future study and the inevitable, ensuing refinements made to experimental designs and

measures, indirect measures may still prove useful in illuminating the processes behind

the instigation of distal defenses in terror management theory.

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APPENDICES

APPENDIX A
AMERICAN STIMULI

APPENDIX B
FOREIGN STIMULI

APPENDIX C
ESSAYS

Pro-American Essay

The first thing that hit me when I came to this country was the incredible freedom people had. 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 you 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 Essay

When I first came to this country from my home, 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.

APPENDIX D
EVALUATION 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