

Extent of Trauma Exposure and PTSD Symptom Severity as Predictors of Anxiety-Buffer Functioning

Armand Chatard¹, Tom Pyszczynski², Jamie Arndt³, Leila Selimbegovic¹, Paul N'Dri Konan¹, Martial Van der Linden¹

¹Department of Psychology, University of Geneva, Switzerland

²Department of Psychology, University of Colorado

³Département of Psychology, University of Missouri

KEYWORDS: anxiety-buffer disruption, trauma, war exposure, PTSD, terror management

ABSTRACT

Two studies conducted in the aftermath of the Cote d'Ivoire civil war tested the anxiety buffer disruption theory prediction that high war exposure and/or high posttraumatic stress disorder (PTSD) are associated with a disruption in normal anxiety buffering functioning. In line with predictions, Study 1 indicated that mortality salience (as compared to a control condition) increased immediate death-related thought accessibility in persons with high but not low levels of PTSD symptoms. Thus, whereas low PTSD symptom participants showed the previously documented apparent suppression of classic priming effects when exposed to death reminders, high PTSD symptom participants did not exhibit this defense. Study 2 demonstrated that mortality salience interacted with trauma exposure to affect reports of trauma symptoms. Specifically, it led individuals high in exposure to the war, but not those low in exposure, to report more trauma symptoms than in the control condition. The discussion addresses the role of anxiety buffer functioning in responses to traumatic stress and how the anxiety buffer disruption theory approach relates to other theories of trauma.

According to *DSM-IV*, posttraumatic stress disorder (PTSD) is precipitated by a traumatic event that typically involves threat to one's own or another's life, and results in (1) recurrent reexperiencing of the traumatic event in flashbacks, nightmares, or intrusive thoughts, (2) avoidance of reminders of the traumatic event and generalized numbing of emotional responses, and (3) heightened arousal, as evidenced by hyper-vigilance, sleep disturbances, or exaggerated startle response (American Psychiatric Association [APA], 2000). The overall picture of the person suffering from PTSD is that of a person struggling with recurrent bouts of overwhelming terror (e.g., Herman, 1997; Horowitz, 1976). Terror management theory (TMT; Greenberg, Pyszczynski, & Solomon, 1986) posits that cultural worldviews, self-esteem, and close interpersonal relationships work together to protect individuals from the potential for anxiety that is a by-product of human awareness of the inevitability of death. The nature of the events that precipitate PTSD and the resulting patterns of thought, behavior, and emotion suggest that TMT might provide a viable framework for conceptualizing at least some of the psychological processes involved in PTSD.

Anxiety Buffer Disruption Theory (ABDT; Abdollahi, Pyszczynski, Maxfield, & Luszczynska, 2008) uses

TMT to provide a broad theoretical framework for understanding diverse human responses to trauma. ABDT builds on previous theories of trauma that emphasize shattered assumptions, malfunctioning schemas, and disrupted meaning systems that occur in response to traumatic events (e.g., Dalglish, 2004; Horowitz, 1974, 1976; Janoff-Bulman, 1992; Koltko-Rivera, 2000, 2004). The central proposition of ABDT is that traumatic events produce their disruptive effects, at least in part, because they disrupt the capacity of the individual's meaning systems, self-esteem, and close relationships to perform their normal anxiety-buffering functions. This leaves the individual susceptible to recurrent bouts of anxiety and intrusive thoughts, and hyper-sensitive to and prone to avoid threat-related stimuli. In this paper, we examined this idea by testing two hypotheses derived from ABDT: (1) high levels of PTSD symptom severity is associated with a disruption of the death-related thought suppression that is typically found in response to mortality salience (cf. Arndt, Greenberg, Solomon, Pyszczynski, & Simon, 1997), and (2) high levels of exposure to trauma are associated with more severe reports of PTSD symptoms in response to reminders of mortality. By assessing these hypotheses with survivors of the recent Côte d'Ivoire civil war, the present studies extend the generality of previous findings (Abdollahi et al., 2008) to a different type of trauma in a different cultural milieu.

From TMT...

TMT posits that awareness of human mortality and vulnerability creates the potential for anxiety that would disrupt normal functioning unless effectively managed. This anxiety is managed in two distinct ways depending on whether thoughts of death are in current conscious attention or are accessible but outside of awareness (Pyszczynski, Greenberg, & Solomon, 1999). When thoughts of death are in current focal attention, proximal terror management defenses are initiated. This first line of defense endeavors to remove death thoughts from focal attention and may entail simply not thinking about death, actively suppressing such thoughts, or trying to convince oneself that one is less vulnerable to death. Consistent with this idea, unlike other types of primes, reminders of death (mortality salience; MS) do not immediately increase the accessibility of death-related thoughts, but the accessibility of such thoughts does increase over time after a delay and distraction (Greenberg, Pyszczynski, Solomon, Simon, & Breus, 1994). Consistent with the idea that this lack of an immediate priming effect reflects active suppression of death-related thought, research has shown that MS primes do produce an immediate increase in death-thought accessibility, similar to that found with other types of primes, when they are presented subliminally (Arndt, Greenberg, Pyszczynski, & Solomon, 1997) or when participants are placed under high cognitive load (Arndt, Greenberg, Solomon, et al., 1997). This latter finding is consistent with Irony Process Theory findings (Wegner, 1989) that cognitive load disrupts thought suppression processes. Denial based proximal defenses entail distorting one's perceptions to imply that one will live a long life and that death will not be a problem until the distant future (Greenberg et al., 1993; Greenberg, Arndt, Simon, Pyszczynski, & Solomon, 2000) or compensatory inflation of positive affect (DeWall & Baumeister, 2008). Health-promoting proximal defenses involve engaging (or intending to engage in) behavior that is likely to decrease vulnerability to death (e.g., decreasing tanning, increasing exercising; see Goldenberg & Arndt, 2009 for a review). In short, proximal defenses are means of coping with thoughts of death that are in current conscious attention in a relatively direct manner by suppressing such thoughts, denying or reducing one's vulnerability to death, or inflating positive affect to counter the potential for anxiety.

Distal defenses, on the other hand, deal with the problem of death when it is on the fringes of

consciousness and do so in a manner that is not directly, logically, or semantically related to the problem of death. Distal terror management defenses involve a tripartite system of imbuing life with meaning, value, and security that entail maintaining: (1) faith in a cultural worldview, (2) one's value within that worldview (commonly referred to as self-esteem), and (3) close interpersonal attachments. Distal defenses are initiated when death-related thoughts are accessible, but not in focal attention. These defenses do not logically imply that one will not die, but rather imbue people with a security-providing sense that they are valued contributors to a meaningful universe. Because TMT is a social psychological theory that was initially developed to explain why people need self-esteem, faith in the correctness of their beliefs and values, and what happens when their self-esteem and worldview confidence is threatened, the vast majority of TMT research has been focused on these distal forms of defense.

Much of the evidence for distal terror management defenses comes from studies that have examined the mortality salience hypothesis or its variants. According to this hypothesis, when people are confronted with death, they strengthen their support for cultural worldviews, self-esteem, and close relationships because these psychological structures provide protection against existential anxiety. Accordingly, MS has been shown to lead to increased worldview defense (for a review, see Greenberg, Solomon, & Arndt, 2007), increased self-esteem striving (for a review, see Pyszczynski, Greenberg, Solomon, Arndt, & Schimel, 2004), and increased concerns for secure attachment (for a review, see Mikulincer, Florian, & Hirschberger, 2003), compared to a variety of control conditions. Conversely, threats to self-esteem (Hayes, Schimel, Faucher, & Williams, 2008), cultural worldviews (Schimel, Hayes, Williams, & Jahrig, 2007), and close relationships (Mikulincer, Florian, Birnbaum, & Malishkevich, 2002), have been shown to increase the accessibility of death-related but not other negative or anxiety-provoking thoughts. Other studies have shown that affirming or defending one's worldview, self-esteem, or close attachments decrease the accessibility of death-related thoughts after MS priming (e.g., Harmon-Jones et al., 1997).

Taken together, these findings provide converging support for the TMT proposition that proximal and distal terror management defenses work together to manage existential anxiety. Given the disruptive effect that anxiety can have on behavior, especially anxiety regarding things that cannot be predicted, controlled, or avoided, a well-functioning anxiety-buffering system would seem essential for psychological well-being and effective functioning.

...to Anxiety Buffer Disruption Theory

Recent research derived from TMT has begun to explore the role of death-related concerns in psychopathology, particularly with regards to anxiety disorders (see Arndt, Routledge, Cox, & Goldenberg, 2005 for a review). For example, Strachan et al. (2007) argue that some anxiety disorders stem from inefficient attempts to cope with death anxiety. In three studies with participants who had different anxiety-related problems (i.e., arachnophobia, compulsive behaviors, and social phobia), compared to control conditions involving other aversive thoughts, reminders of death increased the severity of anxiety-related responses, but only for individuals who had the most pronounced problems with these specific types of anxiety in the first place. For instance, MS increased avoidance of images of spiders, but only for participants who met diagnostic criteria for specific phobia. Similarly, MS increased hand-washing behavior and social avoidance, but only among those who were high on obsessive-

compulsive tendencies and social anxiety, respectively. Along similar lines, Kosloff et al. (2006) examined dissociative responses to 9/11 events as a function of MS. Compared to a control condition, MS increased levels of anxiety sensitivity and reported levels of dissociative responses to 9/11 terrorist attacks among American university students.

ABDT was initially proposed in Pyszczynski, Greenberg, and Solomon's (2003) analysis of Americans' reactions to the 9/11 terrorist attacks, in which they suggested that clinically significant reactions to the trauma of these attacks would be most likely among those for whom the attacks produced a serious disruption of normal anxiety-buffering functioning. From this perspective, traumatic events have the potential to disrupt crucial elements of people's worldviews, self-esteem, and interpersonal attachments, thus rendering them unable to protect themselves from anxiety. Low levels of disruption lead to especially strong efforts to reassert these damaged structures, resulting in increased worldview defense, self-esteem striving, and needs for secure attachments. Consistent with this idea, research conducted in the wake of the 9/11 attacks has shown that reminders of either one's own death or the events of 9/11 increased support for President Bush and his policies, including the use of extreme military force to fight terrorism (e.g., Landau et al., 2004; Pyszczynski et al., 2006). However, more extreme disruption of the anxiety buffer can entail a more thorough collapse of normal anxiety buffering functioning. This is especially likely to occur in response to extremely traumatic events among persons who dissociate at the time of the event and have other factors that predispose them to PTSD (Ozer, Best, Lipsey, & Weiss, 2003). Disruption of anxiety-buffer functioning leaves such persons unprotected from existential fears and prone to the emergence of PTSD-related behavior and symptoms, such as hyperarousal, intrusive thoughts, flashbacks, nightmares, avoidance of trauma-related stimuli, interpersonal difficulties, and substance abuse. From this perspective, many such PTSD-related behaviors are viewed as attempts to cope with the emotional consequences of disruption of normal anxiety-buffer functioning.

ABDT integrates TMT with previous theories of trauma that emphasize shattered assumptions, schemas, meaning systems, or worldviews (e.g., Dalgleish, 2004; Horowitz, 1974, 1986; Janoff-Bulman, 1992; Koltko-Rivera, 2000, 2004). From these perspectives, critical assumptions about the world and oneself are likely to be shattered when people are exposed to terrifying events that violate their understanding of the world as a safe and benevolent place. ABDT posits that this shattering of assumptions disrupts the normal functioning of the anxiety-buffering system. Consequently, threats that would previously have instigated terror management defenses cease to do so, leaving the person prone to extreme distress.

Initial experimental support for ABDT comes from two studies conducted among survivors of the 2005 Zarand earthquake in Iran (Abdollahi et al., 2008). This work showed that: (1) high levels of reported dissociation 1 month post-event are associated with atypical terror management responses in the form of low levels of worldview defense and high levels of negative affect in response to reminders of death at that time, (2) this dissociation predicts severity of PTSD symptoms 2 years later, (3) high levels of PTSD symptoms 2 years later are associated with simultaneous atypical responses to reminders of mortality, and (4) disrupted patterns of worldview defense at 1 month and 2 years posttrauma mediate the relationship between dissociation and PTSD.

In summary, there is growing evidence from clinical and social psychological research that severe trauma can produce a disruption of the anxiety buffer system, resulting in an alteration of terror

management defenses. In addition, this appears particularly likely among individuals who dissociate at the time of the traumatic event and who exhibit the most severe symptoms of PTSD. While this disruption of anxiety-buffering functioning has been demonstrated to occur on distal defenses by Abdollahi et al. (2008), our aim in the current studies was to determine if proximal defenses such as thought suppression and denial of one's problems are also disrupted among those with high levels of trauma exposure and PTSD symptoms.

Overview of Present Research

The goal of the present studies was to determine if previous findings of an association between adverse reactions to trauma and disruption of distal terror management defenses extends to proximal terror management defenses of thought suppression and threat denial. These questions were addressed in two studies, conducted in 2007 and 2008, in the aftermath of the Côte d'Ivoire civil war (September 2002 through March 2007). All participants had been exposed to war but they differed in their levels of war exposure and, concomitantly, in the intensity of their trauma and its sequelae. The disruption of proximal defenses should appear following MS among individuals who are the most disturbed by the war. Hence, we expected that in Study 1, participants with high levels of PTSD symptoms would not show the typical suppression of death related thoughts in response to mortality salience that has been found in many previous studies (e.g., Arndt et al., 1997), and that was expected to be found among participants with low levels of symptoms in the present study. In other words, although low PTSD symptom participants were predicted *not* to show an increase in death thought accessibility in response to death reminders (as compared to a control condition), high PTSD symptom participants were expected to respond to death reminders with higher levels of death thought accessibility. In Study 2, we predicted that mortality salience would lead to a distortion in the reports of trauma symptoms among participants with high but not low exposure to the war. More specifically, mortality salience (as compared to a control condition) would lead to increased reports of PTSD symptoms, but only among participants with high levels of war exposure. Such findings would be consistent with a disruption of proximal defenses, which would complement the findings of Abdollahi et al. (2008) concerning distal defenses.

Study 1

Research suggests that one of the first and simplest means of coping with death-related thoughts is to suppress them when their accessibility increases, so that they do not reach conscious attention. Indeed, unlike other types of priming, exposure to death-related primes does not lead to an immediate increase in accessibility of death-related thoughts (Greenberg et al., 1994) unless the person is put under high cognitive load, which has been shown by previous research (Wegner, 1990) to disrupt thought suppression (Arndt et al., 1997). To determine whether this form of proximal defense is disrupted in persons with high levels of PTSD symptoms, we exposed participants with high and low levels of PTSD symptoms to reminders of the possibility of dying in the civil war or another aversive topic that is not related to death (taking a difficult exam in college), and then assessed the accessibility of death-related thoughts. Like participants in previous TMT studies, participants low in PTSD were not expected to report higher accessibility of death-related thoughts in the MS than in the control condition because they actively suppress such thoughts (Arndt et al., 1997). However, because of the disruption of normal proximal terror management defenses, accessibility of death-related thoughts was expected to increase

among high PTSD participants when they are reminded of their possible death as compared to the control condition.

METHOD

Participants and design.

There were 105 students of the University of Abidjan (19 women and 86 men) who volunteered to participate in a short opinion survey about the civil war. Their mean age was 28.01 years ($SD = 3.36$). To ensure an accurate and ethical presentation of the survey, participants were informed that it could generate unpleasant emotions and were told that they could discontinue participation at any time if they desired. They first completed The Post-Traumatic Stress Checklist-Civilian Version (PCL-C; Weathers & Ford, 1996; Weathers, Litz, Huska, & Keane, 1994). Next, they were randomly assigned to a MS or to a control condition. Finally, they completed a word-completion task used to assess the accessibility of death-related thoughts. The design was thus a 2 (PTSD: low vs. high) X 2 (experimental condition: control vs. MS). The questionnaire was in French, the official language of Côte d'Ivoire.

PTSD assessment.

The PCL-C consists of 17 items, each corresponding to one of the 3 *DSM-IV* PTSD symptom clusters (i.e., reexperiencing, avoidance, and arousal). For each item, participants indicated how much they have suffered from the particular symptom in the last month on a scale ranging from 1 (not at all) to 5 (extremely). The PCL-C has satisfactory psychometric properties and diagnostic efficiency (e.g., Blanchard, Jones-Alexander, Buckley, & Forneris, 1996). A total score was computed (averaging all items), with higher scores indicating stronger PTSD symptoms (Cronbach's $\alpha = .88$).

Mortality salience.

By random assignment, half of the participants answered two questions designed to induce thoughts of their own death ("Please, describe the emotions you feel when you think that you may have been killed during the war" and "Please, imagine and describe the way you may have been killed during this war"). The other half answered two questions designed to induce unpleasant thoughts unrelated to death ("Please, describe the emotions you feel when you think about one of your last difficult exam in college" and "Please, imagine and describe what you have thought and felt during this exam"). This manipulation of mortality salience was modeled after previous work (e.g., Kosloff et al., 2006). However, unlike most previous TMT studies, the present study examined the effects of thoughts about death related to a specific traumatic event.

Accessibility of death-related thoughts.

Death-thought accessibility (DTA) was measured via completion of a word fragment task with death-related and neutral words. Participants had to complete 25 word fragments, 5 of which could be completed with either a death-related word or a neutral word. For example, the fragment T O _ _ _ could be completed as TOMBE (a death-related word) or as TOTAL (a neutral word). The possible French death-related words were tombe (grave), tuerie (slaughter), cercueil (coffin), mort (dead), and deuil (bereavement). The other fragments served as filler items. The number of completed death-related words was used as an indicator of death-related thought accessibility. This task, adapted from Tulving, Schacter, and Stark (1982), has been used successfully in many previous terror management studies

(e.g., Arndt, Cook, Goldenberg, & Cox, 2007; Greenberg et al., 1994; Mikulincer & Florian, 2000).

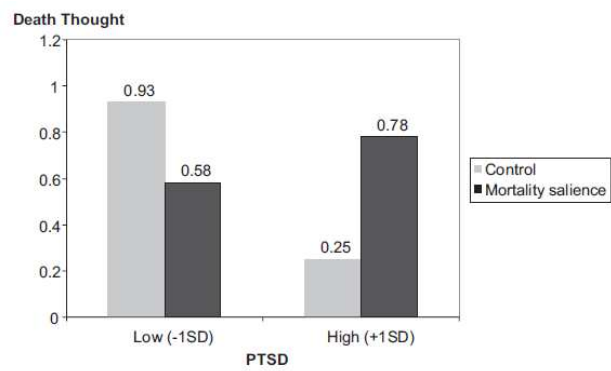
RESULTS

A regression analysis was performed predicting death-related thought accessibility (DTA) from condition (control coded $- .5$, MS coded $.5$), PTSD (continuous variable, centered), and their product term. This analysis revealed no main effect of condition, $B = .09$, $SE = .18$, $\beta = .48$, $t(87) = .48$, ns , or of PTSD, $B = -.01$, $SE = .00$, $\beta = -.14$, $t(87) = -1.28$, ns . However, as predicted, PTSD significantly moderated the effect of condition on DTA, $B = .04$, $SE = .01$, $\beta = .24$, $t(87) = 2.33$, $p < .03$ (see Figure 1). Simple slope tests (computed at ± 1 SD of PTSD) revealed no effect of condition among participants relatively low in PTSD, $B = -.35$, $SE = .26$, $\beta = -.19$, $t(87) = -1.30$, ns . In contrast, participants relatively high in PTSD reported more DTA in the MS than in the control condition, $B = .53$, $SE = .26$, $\beta = .30$, $t(87) = 2.00$, $p < .05$. Simple slope tests also revealed that PTSD was negatively related to DTA in the control, $B = -.03$, $SE = .01$, $\beta = -.38$, $t(87) = -2.46$, $p < .02$, but not in the MS condition, $B = .00$, $SE = .01$, $\beta = .11$, $t(87) = .77$, ns .

DISCUSSION

The present study indicates that, as hypothesized, MS led to an increase in DTA in high- but not in low-PTSD participants. Indeed, although not significant, results among participants low in PTSD were consistent with previous TMT studies on nontraumatized populations suggesting an initial suppression of death-related thoughts following a mortality reminder (Greenberg et al., 1994). These atypical reactions to MS among individuals high in PTSD suggest that high PTSD is associated with a disruption in normal anxiety buffering functioning, as reflected here in impaired suppression. In the control condition, DTA was lower among high- than among low-PTSD participants, consistent with clinical research documenting positive correlations between suppression and PTSD (e.g., Dalgleish, Hauer, & Kuyken, 2008). Thus, under normal circumstances, individuals suffering from strong PTSD symptoms seem to suppress thoughts related to death. However, making death salient apparently eliminates this difference between high- and low-PTSD individuals by provoking a marked DTA increase in high-PTSD individuals. Although predicting a difference in the control condition, to be suppressed in the experimental condition may not be the most conventional hypothesis, this is precisely what would be expected on the basis of ABDT.

Figure 1. Death thought accessibility.



In other words, a defense that high-PTSD individuals manage to use effectively under normal (control) conditions—suppressing death-related thoughts, is not deployed when mortality is made salient. This study provides the first evidence that the disruption of distal terror management defenses among

trauma-exposed persons with high levels of PTSD and predictors of PTSD (dissociation) demonstrated by Abdollahi et al., (2008) extend to proximal terror management defenses like thought suppression. This suggests that the disruption of anxiety-buffer functioning associated with PTSD is rather broad-reaching.

Study 2

ABDT suggests that disrupted anxiety-buffer functioning makes persons more susceptible to the detrimental effects of thoughts about death and the traumatic event, and that this absence of protection is at least partly responsible for many of the symptoms of PTSD. This is consistent with other cognitive theories of PTSD (for comprehensive reviews, see, e.g., Brewin & Holmes, 2003; Dalgleish, 2004), wherein the recurrent intrusive thoughts about the traumatic event and related issues are viewed as exacerbating anxiety and other symptoms of the disorder. According to these models, memories of the event and related thoughts play a major role in PTSD development and symptom etiology (e.g., Brewin, Dalgleish, & Joseph, 1996; Ehlers & Clark, 2000; Foa & Rothbaum, 1998; Foa, Zinbarg, & Olasov-Rothbaum, 1992; Mineka & Zinbarg, 1996, 2006). Indeed, Rubin, Berntsen, and Bohni (2008) recently argued that ongoing memories of the traumatizing event may be more important than the event itself in determining symptoms. From all of these perspectives, as well as ABDT, thoughts of the possibility of dying as a result of the traumatic event would be expected to lead to an exaggeration in the reports of trauma symptoms. This effect of threat would be expected to be found, however, only among those who are especially vulnerable to the disorder. Indeed, less vulnerable individuals would tend to deny their symptoms as a means of coping with the threat, and thus might be expected to report less severe symptoms in the MS than in the control condition. Study 2 was designed to test these hypotheses.

An additional goal of Study 2 was to explore the role of another variable that has been shown to be related to PTSD symptom severity, extent of trauma exposure. Previous studies have shown that the more direct exposure one has to a traumatic event, the more likely one is to experience PTSD and the more severe one's symptoms are likely to be. Virtually all theories of PTSD view the extent of exposure to the event as the first step in the series of psychological events that produce the disorder. Thus far, besides the impact of PTSD symptom severity assessed in Study 1, ABDT research has explored only one predictor of PTSD, peri-traumatic dissociation, and found this variable to be related to both an absence of normal anxiety buffer responses and higher levels of distress in response to thoughts of death or the traumatic event (Abdollahi et al., 2008). Study 2 extends this research by investigating the effect of extent of exposure to the traumatic event on reports of PTSD symptoms in response to reminders of death and the civil war.

To classify participants into two groups as a function of their exposure to war (low vs. high), we used a geographical criterion: we selected students who were either in Abidjan (low exposure) or in Bouake (high exposure) at the time of the war onset. These individuals were comparable in terms of ethnicity, religion, and other demographic indicators. However, there were many more armed confrontations during the war in Bouake than in Abidjan. As a matter of fact, many students from Bouake were compelled to leave their city during the war and to move to Abidjan. Accordingly, students from Bouake were objectively more exposed to the war than students from Abidjan (this difference was verified by ancillary measures in the present study).

Considering this basic difference, it was expected that students from Bouake would report higher PTSD

than students from Abidjan. Furthermore, this main effect of war exposure should be qualified by a reliable interaction between trauma exposure and reminders of the threat of death posed by the war. Because individuals most exposed to war are expected to fail to avoid trauma- and death-related thoughts, they should be more likely than less war-exposed individuals to increase their PTSD reports in the MS compared to the control condition. In contrast, individuals less exposed to the war, and thus less traumatized, would succeed in avoiding ideas associated with the trauma, and not increase their reports of PTSD in response to MS and might even report lower levels of symptoms as a form of defensive denial.

METHOD

Participants and design.

There were 197 students of the University of Abidjan (47 women, 143 men, and 7 gender unspecified participants) who volunteered to participate in a short opinion survey about the civil war. Their mean age was 26.59 years ($SD = 2.70$). As in Study 1, they were informed that it could generate unpleasant emotions and were told that they could discontinue participation at any time if they desired. We selected only participants who were in Abidjan or in Bouake at the time of the war onset. There were 110 students from Bouake (with high war exposure) and 87 students from Abidjan (with low war exposure); six participants were deleted because of missing data, leaving us with a total sample of 191. The design was a 2 (war exposure: high vs. low) X 2 (experimental condition: MS vs. control) between groups factorial. The questionnaire was in French, the official language of Cote d'Ivoire.

Mortality salience.

Participants were randomly assigned to the control or MS condition. To enhance the generality of the findings of this set of studies, a different manipulation of MS was used in this study. In the control condition, participants were asked five closed-ended questions about their student life (e.g., Have you already repeated a year at the University in the past? Yes vs. no), and 2 open-ended questions: "Please describe the emotions you feel when you think about your student life" and "Please imagine and describe how you see yourself in the future, after your studies at the University." McGregor and Marigold (2003) argue that a consideration of the future can arouse uncertainty that they argue is often the threat underlying MS effects. This may be especially unpleasant in the present context given the high rate of unemployment in Côte d'Ivoire (estimated at 40-50% in 2008, cf. Central Intelligence Agency [CIA], 2009). The use of these questions about the future enables us to determine if our induction of thoughts of death in the civil war produced effects above and beyond those of thoughts about the future and uncertainty.

In the MS condition, participants were asked five closed-ended questions about the possibility of death during the civil war, all of which were responded to as yes or no: "Were there armed confrontations in the city you were in at the time of the war onset?," "Were you personally in danger of death during these armed confrontations?," "Do you think that you may have been killed during this war?," "Were you afraid to die at the time of this war?," and "Did you feel afraid for your close others?" These questions, used only in the MS condition, enable us to verify that participants from Bouake have been more exposed to the war, and that they suffered more from this exposure, than participants from Abidjan. Participants were also asked two open-ended questions, modeled after those used in previous research on TMT (Greenberg et al., 1990): "Please, describe the emotions you feel when thinking that you may

have been killed during the war” and “Please, imagine and describe the way you may have been killed during this war.”

Reports of PTSD symptoms.

The PCL-C (Weathers & Ford, 1996; Weathers et al., 1994) was used to assess PTSD symptoms, but this time it served as our dependent variable. A total score was computed (averaging all items), with higher scores indicating stronger PTSD symptoms (Cronbach’s $\alpha = .86$). In addition, separate scores were computed for the three subscales representing each symptom cluster (reexperiencing, avoidance, arousal). Internal consistencies were .84, .62, and .73 for these subscales, respectively.

RESULTS

We first verified if, as expected, participants from Bouake reported more war exposure than participants from Abidjan. To this end, we examined responses on the five closed-ended questions used in the MS condition. As expected, participants from Bouake reported more war exposure than participants from Abidjan. As may be seen in Table 1, participants from Bouake reported significantly greater danger of death, risk of being killed, and fear of dying than participants from Abidjan. Thus, these participants clearly experienced more exposure to traumatic violence in the war, validating our geographical indicator of war exposure.

Table 1 - Percentage of Students Who Agreed With Each Item (Study 2, MS Condition)

	War exposure as a function of participant's city		Statistics	
	Abidjan	Bouake	χ^2	p
1. Armed confrontations	97.2%	100.0%	1.68	ns
2. Danger of death	22.2%	68.9%	19.42	.001
3. Risk to be killed	66.6%	94.8%	13.13	.001
4. Afraid to die	50.0%	82.7%	11.39	.001
5. Afraid for close others	94.4%	98.2%	1.05	ns

Note. Analyses are based on a sample size of 94 (36 participants were from Abidjan and 58 from Bouake); note that only participants in the MS condition were asked these questions about war exposure.

To test our main prediction, we conducted an ANOVA with participants’ war exposure (low vs. high) and experimental condition (MS vs. control) as independent variables to predict reported PTSD symptoms. Results of this analysis revealed no main effect of experimental condition, $F(1, 191) < 1$. However, there was a main effect of war exposure, $F(1, 191) = 9.07, p < .01, \eta^2 = .045$. Overall, highly war-exposed students ($M = 2.55, SD = .81$) reported higher PTSD symptoms than those less exposed to war ($M = 2.21, SD = .82$). As predicted, this main effect was qualified by a reliable interaction, $F(1, 191) = 6.17, p < .02, \eta^2 = .031$ (see Table 2 for means).

This interaction showed that high war-exposure participants reported higher PTSD symptoms in the MS than in the control condition, $t(191) = 2.01, p < .05$. In contrast, participants less exposed to war tended

to report lower PTSD symptoms in the MS than in the control condition, although this difference was not significant, $t(191) = 1.54, p < .11$. Pairwise comparisons also revealed that the difference in reported PTSD between high and low war-exposure students was significant in the MS, $t(191) = 3.92, p < .01$, but not in the control condition, $t(191) = .38, ns$.

Parallel analyses were conducted on each of the 3 PTSD subscales. The means appear in Table 2. As shown in this table, the pattern of results was similar for all symptoms. High war-exposure participants tended to report greater symptoms in the MS than in the control condition, whereas the reverse was true among less war-exposed participants. The predicted interaction was significant on reexperiencing, $F(1, 191) = 11.22, p < .01, \eta^2 = .056$. High war-exposure participants reported significantly more negative reexperiences in the MS than in the control condition, while low war-exposure participants reported significantly less reexperiencing in the MS than control condition (see Table 2). This interaction was not significant on the avoidance, $F(1, 190) = 1.05, ns$, or arousal scales, $F(1, 191) = 1.69, ns$.

DISCUSSION

In line with the notion that more extreme war exposure produces greater disruption of the anxiety buffering system, high war exposure participants from Bouake reported higher PTSD symptoms in the MS condition than in the control condition. In contrast, low war exposure participants from Abidjan tended to report lower PTSD symptoms overall in the MS than in the control condition. This elevation among the high war exposure participants is consistent with the idea that in the absence of an effective anxiety-buffering system, as documented in Study 1 and by Abdollahi et al. (2008), thoughts of death related to the traumatic event lead to a subjective increase in the distress provoked by trauma-related experiences.

These findings can also be viewed as another example of disrupted anxiety-buffer functioning. From this perspective, the significantly lower levels of the PTSD symptom cluster, reexperiencing, found after MS in the low war exposure participants could reflect a form of denial—thoughts of dying in the war led these participants to claim that they were less disturbed by the war. This minimization of one’s suffering in response to reminders of the traumatic event might be part of a defensive strategy for maintaining self-efficacy regarding one’s ability to cope with the threatening events (e.g., Benight & Bandura, 2004; Benight & Harper, 2004). High war exposure participants did not show this reaction, and in fact, reported greater symptom severity when reminded of the possibility of dying in the war.

Table 2 - Means of PTSD Symptoms by City of Origin and Condition, Study 2

	Reexperiencing	Avoidance	Arousal	PTSD total
Low exposure (Abidjan)				
Control	2.79 _a (1.35)	2.09 _a (.85)	2.16 _a (1.13)	2.33 _a (.89)
MS	2.18 _b (1.06)	1.96 _a (.69)	2.12 _a (1.12)	2.05 _a (.69)
High exposure (Bouake)				
Control	2.73 _a (1.17)	2.14 _a (.72)	2.40 _a (1.11)	2.39 _a (.75)
MS	3.30 _b (1.17)	2.24 _a (.83)	2.75 _a (1.07)	2.70 _b (.84)

Note. Analyses are based on a sample size of 191. For each city and each column, the means with a different subscript differ at least at $p < .05$.

The fact that the interaction reached significance on reexperiencing but not avoidance or arousal is consistent with the cognitive theories of PTSD that emphasize the role of associative networks (e.g., Ehlers & Clark, 2000; Foa, Zinbarg, & Olasov-Rothbaum, 1992; Foa & Rothbaum, 1998). When high trauma exposure participants were reminded of the possibility of dying in the war, this may have activated other trauma-related memories that led them to report higher levels of reexperiencing. Such activation of thoughts related to the event may be less likely to extend to thoughts about past feelings of arousal or avoidant behavior (thus, the weaker effects on these subscales). From the perspective of ABDT, the fact that participants were not suppressing death-related thoughts, as demonstrated in Study 1, or using other types of terror management defenses, as demonstrated by Abdollahi et al. (2008), would make such activation of related thoughts especially likely for these individuals.

All in all, these findings are consistent with our prediction that high war exposure would elicit a disruption of the anxiety buffer system, which is manifested here in an overestimation of past symptoms. We can safely conclude that this was an overestimation rather than an actual difference in what was experienced because the MS manipulation, to which participants were randomly assigned at the time of the study, could not affect what participants experienced before the study.

General Discussion

The results of the present studies shed new light on the relations among death concerns, anxiety-buffer functioning, and PTSD-related behavior in individuals with high levels of trauma exposure and PTSD symptoms. In line with ABDT, individuals high in PTSD in Study 1 and those high in war exposure in Study 2 showed atypical reactions to death reminders compared to those low on these dimensions, which were similar to the reactions previously documented in nontraumatized samples. Consistent with the view that trauma entails a disruption in normal anxiety buffering functioning, the results show that: (1) high PTSD was associated with increased accessibility of death-related thoughts after a death reminder, which suggests an absence of the suppression of such thoughts that has been demonstrated in previous research (Arndt, Greenberg, Solomon, et al., 1997), and (2) high war exposure was associated with reports of more severe PTSD symptoms (i.e., more negative appraisals of trauma) after a death reminder. These findings extend those of Abdollahi et al. (2008), and indicate that trauma exposure may entail a disruption of even the simplest proximal terror management mechanisms, such as suppression and denial.

Current cognitive models of PTSD, such as those of Ehlers and Clark (2000) and Rubin et al. (2008), emphasize the way trauma-exposed individuals process trauma-related memories. According to Ehlers and Clark (2000), negative appraisals of the trauma are central to the development and persistence of PTSD symptoms. In line with these views, Study 2 indicated that individuals highly exposed to war did not report more PTSD symptoms than individuals less exposed to war, unless they were primed with a mortality-related trauma reminder. However, after MS, the divergence emerged, as high war exposure was related to more negative appraisals of past symptoms. Thus, this finding complements previous research by suggesting that individuals high and low in war exposure may not necessarily differ in the frequency of PTSD symptoms. Rather, one crucial difference between these two groups seems to be the way in which they mentally regulate trauma-related memories in response to stimuli that could prime additional trauma-related thoughts.

In this way, Study 2 results are consistent with previous research by Strachan et al. (2007) in a clinical population, and by Kosloff et al. (2006) in a trauma-exposed population, showing more anxious responses after a death reminder than in control conditions. Study 1 extended these findings in an important way, pointing to a possible cognitive mechanism to account for such effects (i.e., the accessibility of death-related thoughts). It appears that individuals low in PTSD successfully suppressed death-related thoughts in response to reminders of the trauma: they did not exhibit higher death-related thought accessibility in the MS than in the control condition. In contrast, individuals high in PTSD failed to suppress death-related thoughts when reminded of their possible death during the war. For the latter, death-related thought accessibility was higher in the MS than in the control condition.

Interestingly, in the absence of MS, high PTSD participants in Study 1 showed lower levels of death-related thought accessibility than low PTSD participants. This may reflect the avoidant tendency that is characteristic and indeed part of the definition of PTSD. This avoidance disappeared, however, when these high PTSD participants were reminded of the traumatic event. In this sense, avoidance and suppression appear to be inefficient when individuals with PTSD are confronted with trauma memories, that is, when they most need effective coping strategies (for a similar conclusion, see Dalgleish et al., 2008). In line with Ehlers and Clark's (2000) model, a failure in the mental regulation of death-related thoughts when trauma memories are brought to consciousness may contribute to a sense of current threat, and thus play a central role in the persistence of PTSD symptoms.

One alternative explanation for the present results must be addressed. It seems plausible that vulnerable individuals (high-PTSD or those highly exposed to war) have stronger reactions to MS not because their defenses collapse but because of a simple priming effect. Because these individuals have been strongly traumatized, their semantic memory may be richer in death and trauma-related material and thus more responsive to priming death than the semantic memory of those less traumatized. This explanation seems an unlikely explanation for the present findings for at least two reasons. First, even if the reaction of less vulnerable individuals to MS was weaker, it would still be expected to be in the same direction as the reaction of those highly vulnerable. However, in both studies, the reaction of those high and low vulnerable persons to MS go in the opposite direction. Second, recall that in the first study control condition, high-PTSD participants had lower DTA than low-PTSD participants. This strongly suggests that there is suppression under normal circumstances in high-PTSD participants (otherwise, if anything, they would be expected to have higher DTA than low-PTSD participants). If this difference is eliminated in the MS condition because of a significant increase in DTA among high-PTSD participants, this seems to point to a collapse of the suppression defense mechanism, rather than to a simple priming effect. For these reasons, priming does not account for the present findings as well as the ABDT explanation.

The results of the present studies may have implications for cognitive behavior therapy (CBT) of PTSD (see Harvey, Bryant, & Tarrier, 2003 for a comprehensive review). CBT is primarily based on repeated imagined exposure, requiring patients to focus on the most distressing aspects of the trauma memories, and to write down detailed descriptions of their traumatic experience. CBT has been found to be effective in preventing PTSD development and maintenance. However, the precise mechanisms responsible for the effectiveness of CBT are not entirely clear (Harvey et al., 2003). The most commonly proposed mechanism is habituation to fear, which is expected to reduce anxiety. From the perspective of ABDT, however, recovering from trauma would be greatly facilitated by the restoration of effective

anxiety buffer functioning. Such a restoration may be encouraged by aspects of CBT that provide meaning, self-esteem, and relatedness to those being treated. Further research is needed to examine this possibility.

Some limitations of the present studies need to be acknowledged. One issue is the fact that our experimental inductions did not differentiate between trauma-related memories and death-related memories. In the experimental conditions, participants were asked to imagine their own possible death during the war. In all likelihood, this induction simultaneously activated both concerns about death and trauma-related memories. However, by definition, a traumatic event involves “*actual or threatened death or serious injury or a threat to the physical integrity of self or others*” eliciting “*intense fear, helplessness, or horror*” (American Psychiatric Association, 1994, pp. 427-428). Thus, it seemed to us quite difficult to differentiate between the two in the context of the experience of traumatized persons. Moreover, previous research has found that a mortality salience condition led to essentially the same effects as a trauma salience condition (see Abdollahi et al., 2008). However, it may be of interest to examine the amount of overlap between the two constructs in future research.

In conclusion, the present studies show that high war exposure and high PTSD are associated with an alteration in the most basic proximal terror management defenses, that is, thought suppression and denial. This suggests that recovering from trauma might necessitate restoring an effectively functioning anxiety buffer. This opens new avenues for research in both the laboratory and, as in the present studies, in naturalistic settings. It also suggests new avenues to be explored regarding the process of recovery from this devastating psychological condition.

References

- Abdollahi, A., Pyszczynski, T., Maxfield, M., & Luszczynska, A. (2008). *Anxiety buffer disruption theory: The relationship between dissociation, anxiety-buffer functioning and severity of post-traumatic symptoms*. Manuscript submitted for publication, Islamic Azad University-Zarand Branch, Iran.
- American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, DC: Author.
- Arndt, J., Cook, A., Goldenberg, J. L., & Cox, C. R. (2007). *Cancer and the threat of death: The cognitive dynamics of death thought suppression and its impact on behavioral health intentions*. *Journal of Personality and Social Psychology*, 92, 12-29.
- Arndt, J., Greenberg, J., Pyszczynski, T., & Solomon, S. (1997). *Subliminal exposure to death-related stimuli increases defense of the cultural worldview*. *Psychological Science*, 8, 379-385.
- Arndt, J., Greenberg, J., Solomon, S., Pyszczynski, T., & Simon, L. (1997). *Suppression, accessibility of death-related thoughts, and cultural worldview defense: Exploring the psychodynamics of terror management*. *Journal of Personality and Social Psychology*, 73, 5-18.
- Arndt, J., Routledge, C., Cox, C. R., & Goldenberg, J. L. (2005). *The worm at the core: A terror management perspective on the roots of psychological dysfunction*. *Applied and Preventative Psychology*, 11, 191-213.
- Benight, C. C., & Bandura, A. (2004). *Social cognitive theory of posttraumatic recovery: The role of perceived self-efficacy*. *Behaviour Research and Therapy*, 42, 1129-1148.
- Benight, C. C., & Harper, M. L. (2002). *Coping self-efficacy perceptions as a mediator between acute stress response and long-term distress following natural disasters*. *Journal of Traumatic Stress*, 15, 177-186.

- Blanchard, E. B., Jones-Alexander, J., Buckley, T. C., & Forneris, C. A. (1996). Psychometric properties of the PTSD Checklist (PCL). *Behaviour Research and Therapy*, 34, 669 - 673.
- Brewin, C. R., Dalgleish, T., & Joseph, S. (1996). A dual representation theory of posttraumatic stress disorder. *Psychological Review*, 103, 670 - 686.
- Brewin, C. R., & Holmes, E. (2003). Psychological theories of posttraumatic stress disorder. *Clinical Psychology Review*, 23, 339 -376.
- Central Intelligence Agency. (2009). The 2008 world factbook. Retrieved from www.cia.gov/library/publications/the-world-factbook/index.html
- Dalgleish, T. (2004). Cognitive approaches to posttraumatic stress disorder: The evolution of multirepresentational theorizing. *Psychological Bulletin*, 130, 228-260.
- Dalgleish, T., Hauer, B., & Kuyken, W. (2008). The mental regulation of autobiographical recollection in the aftermath of trauma. *Current Direction in Psychological Science*, 17, 259-263.
- DeWall, C. N., & Baumeister, R. F. (2007). From terror to joy: Automatic tuning to positive affective information following mortality salience. *Psychological Science*, 18, 984-990.
- Ehlers, A., & Clark, D. M. (2000). A cognitive model of posttraumatic stress disorder. *Behaviour Research and Therapy*, 38, 319 -345.
- Foa, E., Zinbarg, R., & Olasov-Rothbaum, B. (1992). Uncontrollability and unpredictability in post-traumatic stress disorder: An animal model. *Psychological Bulletin*, 112, 218 -238
- Foa, E. B., & Rothbaum, B. O. (1998). *Treating the trauma of rape: Cognitive behavioral therapy for PTSD*. New York: Guilford Press.
- Goldenberg, J. L., & Arndt, J. (2008). The implications of death for health: A terror management health model for behavioral health promotion. *Psychological Review*, 115, 1032-1053.
- Greenberg, J., Arndt, J., Simon, L., Pyszczynski, T., & Solomon, S. (2000). Proximal and distal defenses in response to reminders of one's mortality: Evidence of a temporal sequence. *Personality and Social Psychology Bulletin*, 26, 91-99.
- Greenberg, J., Pyszczynski, T., & Solomon, S. (1986). The causes and consequences of a need for self-esteem: A terror management theory. In R. F. Baumeister (Ed.), *Public self and private self* (pp. 189 -212). New York: Springer-Verlag
- Greenberg, J., Pyszczynski, T., Solomon, S., Pinel, E., Simon, L., & Jordan, K. (1993). Effects of self-esteem on vulnerability-denying defensive distortions: Further evidence of an anxiety-buffering function of self-esteem. *Journal of Experimental Social Psychology*, 29, 229-251.
- Greenberg, J., Pyszczynski, T., Solomon, S., Rosenblatt, A., Veeder, M., Kirkland, S., & Lyon, D. (1990). Evidence for terror management II: The effects of mortality salience on reactions to those who threaten or bolster the cultural worldview. *Journal of Personality and Social Psychology*, 58, 308-318.
- Greenberg, J., Pyszczynski, T., Solomon, S., Simon, L., & Breus, M. (1994). Role of consciousness and accessibility of death-related thoughts in mortality salience effects. *Journal of Personality and Social Psychology*, 67, 627-637.
- Greenberg, J., Solomon, S., & Arndt, J. (2007). A uniquely human motivation: Terror management. In J. Shah & W. Gardner (Eds.), *Handbook of motivation science* (pp. 113-134). New York: Guilford Press.
- Harmon-Jones, E., Simon, L., Greenberg, J., Pyszczynski, T., Solomon, S., & McGregor, H. (1997). Terror management theory and self-esteem: Evidence that increased self-esteem reduces mortality salience effects. *Journal of Personality and Social Psychology*, 72, 24 -36.

Harvey, A. G., Bryant, R. A., & Tarrier, N. (2003). *Cognitive behaviour therapy of posttraumatic stress disorder*, *Clinical Psychology Review*, 23, 501-522.

Hayes, J., Schimel, J., Faucher, E. H., & Williams, T. J. (2008). Evidence for the DTA hypothesis II: Threatening self-esteem increases death thought accessibility. *Journal of Experimental Social Psychology*, 44, 600 - 613.

Herman, J. L. (1997). *Trauma and recovery*. New York: Basic Books.

Horowitz, M. (1974). Stress response syndromes, character style, and dynamic psychotherapy. *Archives of General Psychiatry*, 31, 768 -781.

Horowitz, M. J. (1976). *Stress response syndromes*. New York: Aronson. Janoff-Bulman, R. (1992). *Shattered assumptions: Towards a new psychology of trauma*. New York: Free Press.

Koltko-Rivera, M. E. (2000). *The Worldview Assessment Instrument (WAI): The development and preliminary validation of an instrument to assess world view components relevant to counseling and psychotherapy* (Doctoral dissertation, New York University, 2000). *Dissertation Abstracts International*, 61(04), 2266B. (UMI Microform No. 9968433)

Koltko-Rivera, M. E. (2004). The psychology of worldviews. *Review of General Psychology*, 8, 3-58.

Kosloff, S., Solomon, S., Greenberg, J., Cohen, F., Gershuny, B., Routledge, C., & Pyszczynski, T. (2006). *Fatal distraction: The impact of mortality salience on dissociative responses to 9/11 and subsequent anxiety sensitivity*. *Basic and Applied Social Psychology*, 28, 349 -356.

Landau, M. J., Solomon, S., Greenberg, J., Cohen, F., Pyszczynski, T., Arndt, J., . . . Cook, A. (2004). Deliver us from evil: The effects of mortality salience and reminders of 9/11 on support for President George W. Bush. *Personality and Social Psychology Bulletin*, 30, 1136-1150.

McGregor, I., & Marigold, D. C. (2003). Defensive zeal and the uncertain self: What makes you so sure? *Journal of Personality and Social Psychology*, 85, 838-852.

Mikulincer, M., & Florian, V. (2000). Exploring individual differences in reactions to mortality salience: Does attachment style regulate terror management mechanisms? *Journal of Personality and Social Psychology*, 79, 260 - 273.

Mikulincer, M., Florian, V., Birnbaum, G., & Malishkevich, S. (2002). The death-anxiety buffering function of close relationships: Exploring the effects of separation reminders on death-thought accessibility. *Personality and Social Psychology Bulletin*, 28, 287-299.

Mikulincer, M., Florian, V., & Hirschberger, G. (2003). The existential function of close relationships: Introducing death into the science of love. *Personality and Social Psychology Review*, 7, 20-40.

Mineka, S., & Zinbarg, R. (1996). Conditioning and ethological models of anxiety disorders: Stress-in-dynamic-context anxiety models. In D. Hope (Ed.), *Perspectives on anxiety, panic, and fear* (43rd annual Nebraska Symposium on Motivation). Lincoln: University of Nebraska Press.

Mineka, S., & Zinbarg, R. (2006). A contemporary learning theory perspective on the etiology of anxiety disorders: It's not what you thought it was. *American Psychologist*, 61, 10 -26.

Ozer, E. J., Best, S. R., Lipsey, T. L., & Weiss, D. S. (2003). Predictors of posttraumatic stress disorder and symptoms in adults: A meta-analysis. *Psychological Bulletin*, 129, 52-73.

Pyszczynski, T., Abdollahi, A., Solomon, S., Greenberg, J., Cohen, F., & Weise, D. (2006). Mortality salience, martyrdom, and military might: The Great Satan versus the Axis of Evil. *Personality and Social Psychology Bulletin*, 32, 525-538.

Pyszczynski, T., Greenberg, J., & Solomon, S. (1999). A dual-process model of defense against conscious and

unconscious death-related thoughts: An extension of terror management theory. Psychological Review, 106, 835- 845.

Pyszczynski, T., Greenberg, J., & Solomon, S. (2003). *In the wake of 9/11: The psychology of terror*. Washington, DC: American Psychological Association.

Pyszczynski, T., Greenberg, J., Solomon, S., Arndt, J., & Schimel, J. (2004). Why do people need self-esteem? A theoretical and empirical review. *Psychological Bulletin*, 130, 435- 468.

Rubin, D. C., Berntsen, D., & Bohni, M. K. (2008). A memory based model of posttraumatic stress disorder. *Psychological Review*, 115, 985-1011.

Schimel, J., Hayes, J., Williams, T., & Jahrig, J. (2007). Is death really the worm at the core? Converging evidence that worldview threat increases death-thought accessibility. *Journal of Personality and Social Psychology*, 92, 789 - 803.

Strachan, E., Schimel, J., Arndt, J., Williams, T., Solomon, S., Pyszczynski, T., & Greenberg, J. (2007). Terror mismanagement: Evidence that mortality salience exacerbates phobic and compulsive behaviors. *Personality and Social Psychology Bulletin*, 33, 1137-1151.

Tulving, E., Schacter, D. L., & Stark, H. A. (1982). Priming effects in word-fragment completion are independent of recognition memory. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 8, 336-342.

Weathers, F., & Ford, J. (1996). Psychometric review of PTSD Checklist. In B. H. Stamm (Ed.), *Measurement of stress, trauma, and adaptation* (pp. 250 -251). Lutherville, MD: Sidran Press.

Weathers, F. W., Litz, B. T., Huska, J. A., & Keane, T. M. (1994). *The PTSD Checklist-Civilian Version (PCL-C)*. Boston: National Center for PTSD.

Wegner, D. M. (1989). *White bears and other unwanted thoughts*. New York: Viking/Penguin.