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Optimism, Pessimism, and Terror Management: Evidence That Strategic Optimists Experience DTA Using Incongruent Self-Regulation After Self-esteem Threat

by

Erik H. Faucher

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Examining Committee:

Dr. Jeff Schimel, Department of Psychology

Dr. Kimberly Noels, Department of Psychology

Dr. Takahiko Masuda, Department of Psychology

Dr. Esther Fujiwara, Department of Psychiatry

ABSTRACT

Terror management theory (TMT) has accumulated a large literature over the past two decades, but has yet to examine whether forms of optimism and pessimism serve a terror management function. The present study tested the death thought accessibility (DTA) hypothesis using a general self-esteem threat (participants were told they would have to give an impromptu speech in front of their peers) with social defensive pessimists and strategic optimists. After participants read the speech over, they were given a set of instructions either congruent with the preparation of a defensive pessimist or congruent with the preparation of a strategic optimist. DTA was assessed thereafter. It was predicted that defensive pessimists and strategic optimists would exhibit high DTA when given incongruent instructions relative to congruent instructions. Results showed that defensive pessimists had high levels of DTA in both conditions, whereas strategic optimists had high DTA in only the incongruent instructions condition.

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Introduction

Anytime we set out to accomplish something personally important there is the possibility of failure, which is a potential self-esteem threat. If we succeed in the task at hand we feel good about ourselves and important; however if we fail, we may feel worthless and inadequate. Indeed, a large empirical literature shows that self-esteem rises and falls depending on one's success in meeting contingencies of self-worth in personally important domains (Crocker & Wolfe, 2001). Likewise, when people feel as though they are living up to self-esteem relevant standards they are generally less anxious, less vulnerable to psychological problems such as depression, and are more protected from existentially based fear (Greenberg, et al., 1992; Greenberg et al., 1993). The ongoing maintenance of self-esteem is therefore important for psychological equanimity. A key way of maintaining self-esteem is to mentally prepare for tasks in which failure and negative social evaluation would likely undermine one's sense of self-worth. However, people may have very different ways of mentally preparing for threatening tasks. According to Norem (2008), people with an optimistic orientation toward life feel more comfortable approaching a task with an optimistic attitude, whereas pessimists may feel more comfortable approaching a task with negative expectations. Thus, when optimists vs. pessimists are able to use their preferred strategy, they may feel less distressed prior to a self-esteem threatening task than if they are made to use an incongruent preparation strategy. The following research was designed to test this hypothesis from the perspective of a terror management theory (TMT) analysis of self-esteem.

Terror management theory

Terror management theory (Greenberg, Solomon, & Pyszczynski, 1997) starts with the assumption that humans, like all living organisms, possess a basic drive toward continued life. However unlike all other animals, humans evolved superior cognitive abilities such as language, temporal thought, and self-reflection, making them aware that they exist and therefore one day will not exist. Moreover, human beings are intelligent enough to know that death is inevitable and can occur without warning and in the absence of imminent threats from a variety of different sources that they can never fully anticipate or control despite their best efforts. Succinctly, we are animals with a deep desire to live, but burdened with the awareness of an inevitable fate, which creates the potential for overwhelming anxiety. This is the "terror" part of the theory.

To function normally without being overwhelmed with existential anxiety humans needed to devise a method of "effectively" dealing with this frightening truth. This is the "management" part of the theory. According to Ernest Becker (1971, 1973, 1975), who laid the groundwork for TMT, large scale belief systems function to imbue human life with meaning, stability and a sense of significance, which TMT labels cultural worldviews. By following and meeting specific standards set forth by cultural worldviews, humans attain a sense of self-worth, which is the feeling that one is a valuable member of one's cultural worldview. Self-esteem helps people deal with existential fear by conferring a sense of death transcendence that can be symbolic and/or literal. Symbolic death transcendence refers to obtaining or creating something that will exist in the culture long after

one is dead (e.g., a published article, a piece of artwork, or children). Literal immortality is the promise of some form of an afterlife conferred to devout followers by essentially every religion. Thus, from the perspective of TMT, pursuing self-esteem is purely cultural and serves to buffer anxiety resulting from the awareness that death is inevitable.

Evidence for TMT

Research supporting TMT has come primarily from two hypotheses, the anxiety-buffer hypothesis and the mortality salience (MS) hypothesis, which I discuss in turn. If, as TMT suggests, self-esteem equips an individual for protection from anxiety, then momentarily increasing self-esteem or high trait self-esteem should be associated with less anxiety in response to anxiety provoking stimuli. This prediction is supported by numerous correlational studies showing a negative relationship between self-esteem and anxiety (see Solomon, Greenberg, & Pyszczynski, 1991). More direct support for the anxiety buffer hypothesis comes from a series of experiments by Greenberg et al. (1992). In one study participants were given positive personality feedback and then completed a state anxiety measure directly after viewing graphic images of death. Participants who were given positive personality feedback, which was designed to boost their self-esteem, reported significantly less anxiety than control participants who did not receive a self-esteem boost. In a second study, positive self-esteem feedback from an intelligence test led to less physiological arousal than control participants who were given no feedback in anticipation of receiving electric shocks. In a related vein, Greenberg et al., (1993) showed that self-esteem levels moderated

participants' need to defend against death anxiety. For example in one study, Greenberg et al. (1993; Study 2) told participants with low vs. high levels of self-esteem that either low vs. high emotionality is associated with an early death. Participants then completed a measure of emotionality. Whereas low self-esteem participants reported the opposite of whichever level of emotionality they were led to believe was associated with an earlier death, high self-esteem participants showed no such bias. These studies provide converging evidence for the TMT proposition that self-esteem buffers individuals from anxiety in general as well as existentially-based fear.

The other hypothesis, the mortality salience (MS) hypothesis, has been demonstrated in the bulk of terror management research. This hypothesis states that if cultural worldviews protect people from thoughts and concerns about death, then reminders of death should temporarily increase their need for faith in the worldview, and should increase striving to meet the specific standards set forth by the worldview (i.e., self-esteem striving). The earliest research examining the MS hypothesis investigated whether a reminder of death would increase liking for those who validate the cultural worldview and decrease liking for those who oppose it (Greenberg et al., 1990). In the first study of that research, Greenberg et al. (1990) found that Christian participants formed a more favorable impression of a fellow Christian and a less favorable impression of a Jewish person after a reminder of death relative to a control condition (Study 1). In a second study, a reminder of death (vs. control) caused participants high in the personality trait authoritarianism to show more dislike of an individual with different political

views than participants low in authoritarianism. According to Greenberg et al. (1990), higher authoritarianism in this study moderated liking of a person with different political leanings because participants with higher levels of authoritarianism possess a worldview that is less likely to value tolerance than participants with lower levels of that trait. Finally, a third study demonstrated that MS (vs. control) increased favoritism toward an individual who praised the United States, and disdain for an individual who criticized it (Study 3).

Even more striking evidence for the MS hypothesis concerns aggression. McGregor et al. (1998) examined aggression as a function of MS on political beliefs. This research had liberal vs. conservative participants write about their political opinions of the United States, and later on in the study they would exchange their essay with another participant. After writing the essays, participants completed some personality measures that included the MS manipulation (vs. control). Upon completion of the personality measures, participants were given an essay ostensibly written by another participant in the study. One essay was designed to threaten conservative beliefs, and the other essay was designed to threaten liberal beliefs. In the last part of the experiment, after each participant had read the essay supposedly written by another participant, participants were instructed to administer an amount of hot sauce to the participant of the essay they had read as part of an investigation of personality and food preferences. Importantly, the experimenter told participants that the target person did not like spicy food and would have to eat all of the hot sauce. McGregor et al. (1998) predicted that participants under MS would administer

more hot sauce to a fellow participant when the essay they read conflicted with their political beliefs relative to control participants. The results supported this prediction.

MS effects are not solely a phenomenon of the United States. On the contrary, conceptually similar effects have been obtained in various European countries (e.g., the Netherlands, Germany), East Asia (e.g., Japan), Australia, and in the Middle East (e.g., Israel, Iran). For instance after being reminded of their own death Dutch participants predicted their soccer team would score more goals than a German team in an upcoming match relative to control participants (Dechesne, Greenberg, Arndt, & Schimel, 2000). Similarly, research from Kashima, Halloran, Yuki and Kashima (2004) showed that MS reduced individualism in Japan, but enhanced individualism in Australia relative to control conditions. Furthermore, Iranian participants preferred a student who supported martyrdom after MS compared to a student who did not support martyrdom, whereas the opposite was found for control participants (Pyszczynski et al., 2006).

Finally, research has supported the MS hypothesis in a number of different self-esteem domains. Studies have shown that participants who derive self-esteem from tanning reported more interest in tanning products after MS (Routldege, Arndt, & Goldenberg, 2004), participants who indicated that physical strength was important for their self-esteem squeezed a hand dynamometer harder after MS (Peters, Greenberg, Williams, & Schneider, 2005), participants whose self-esteem was based on materialistic values overestimated their future financial success after MS (Kasser & Sheldon, 2000), and male Israeli soldiers who derived

self-esteem from their driving ability drove more reckless and faster after MS, presumably to show off their driving skills (Taubman, Florian, & Mikulincer, 1999). In sum, the MS hypothesis has been supported with worldview defense and in different self-esteem domains, using participants from different cultures, different dependent variables and different death reminders (for a review see Burke, Martens, & Faucher, 2010).

The DTA hypothesis

Although the lion's share of terror management studies have been generated in support of the MS hypothesis, another hypothesis derived from TMT that has gained support in recent years is the death thought accessibility (DTA) hypothesis. The DTA hypothesis is essentially the inverse of the MS hypothesis. This hypothesis states that if a psychological structure functions to protect people from thoughts and concerns about death, then threatening that structure should allow thoughts of death to become highly accessible to awareness (Schimel, Hayes, Williams, & Jahrig, 2007). To assess the DTA hypothesis, Schimel et al. conducted a series of studies in which Canadian participants who were highly invested in the Canadian worldview were exposed to a webpage that derogated various aspects of Canadian culture (e.g., socialized healthcare and hockey), or a webpage that derogated various aspects of Australian culture (e.g., the parliament system and rugby). After reading the website, participants engaged in a word fragment completion task (e.g., Greenberg, Pyszczynski, Solomon, Simon, & Breus, 1994), which has participants complete a series of word fragments with the first word that comes to mind. Participants in the anti-Canada condition had

significantly higher levels of DTA compared to participants in the anti-Australia condition (Study 1). However, when participants were able to dismiss the threatening anti-Canada material by reading a disclaimer saying that the author of the webpage had renounced his opinion of Canada and had taken the material off of the internet, DTA remained low compared to participants who did not read the disclaimer, but who still saw the same webpage (Study 2). Schimel and colleagues reasoned that when participants were able to discount the threatening information it was rendered less potent and DTA remained at a low level. A third study used a different measure of DTA than the previous two, by way of a lexical decision task (LDT). This task presents a string of letters on a computer screen. The participant is instructed to distinguish whether or not the letters form a real word as quickly as they can. Throughout the task there were six death words and six negative words, which allowed for the simultaneous measurement of DTA and negative thoughts. Faster reaction times to death words and negative words indicate higher levels of DTA and negative constructs respectively. The results replicated the previous two studies such that DTA was higher in response to worldview threat relative to a control condition, and DTA was independent of negative thoughts. Similarly, a fourth study showed DTA to be independent of anxiety and affect, which is consistent with previous terror management findings (see Solomon, Greenberg, & Pyszczynski, 2004). Finally, increased DTA under worldview threat was observed with participants who held creationism as a worldview. This study found that participants who strongly identified with creationism had higher

DTA after reading a brief anti-creationist article compared to participants who strongly identified with evolution (Study 5).

Research has also looked at the DTA hypothesis in conjunction with self-esteem threats (Hayes, Schimel, Faucher, & Williams, 2008). In one study participants who held intelligence as part of their self-esteem were given false feedback on an IQ test telling them they either scored below average (i.e., received negative feedback) or above average (i.e., received positive feedback). Participants in the control condition were given no feedback. The results showed that participants in the negative feedback condition responded significantly faster to words related to mortality in a LDT compared to participants in the positive feedback and control conditions. Importantly, and as demonstrated in Schimel et al. (2007), faster reaction times were observed only for death words and not negative words. A subsequent study demonstrated similar results with career suitability. In this study, participants who were highly invested in pursuing a career were given feedback either telling them they were suited for their career choice, or ill-suited for their career choice. Using the same LDT paradigm as in the previous study, Hayes et al. observed faster reaction times to death words for participants in the ill-suited career condition compared to the well-suited career condition. A final study demonstrated that fortifying self-esteem after threat, via self-affirmation, lowered DTA to a baseline level compared to participants who did not receive a self-affirmation manipulation, but did receive a threat. Other DTA research concerning threats to the self comes from Ogilive, Cohen, and Solomon (2008). These researchers had participants write about their self at best

vs. self at worst (i.e., desired self vs. undesired self). Participants given undesired self salience showed significantly higher levels of DTA on a word stem completion task compared to participants given self at best salience.

Finally, research demonstrating high DTA in response to meaning and self-esteem threats has come from the terror management function of close relationships (for a review see Mikulincer, Florian, & Hirschberger, 2004). This work suggests that close relationships provide people with self-esteem. Indeed, it is a tremendous boost in personal confidence to know that another person is on one's side through good times and bad, sees one's positive characteristics, and finds one to be interpersonally attractive. Moreover, relationships provide people with the means of achieving death transcendence through the possibility of procreation and the raising of offspring that remember one's life and accomplishments and pass on one's legacy (e.g., Lifton, 1979). Thus, because relationships are a significant source of self-esteem and provide a basis for symbolic immortality they should serve an important terror management function. Consistent with the DTA hypothesis, when participants were asked to imagine problems in their current romantic relationship they completed more word fragments with death words than neutral words (Florian, Mikulincer, & Hirschberger, 2002). Other interpersonally based evidence testing the DTA hypothesis has been shown with threats to marriage (Basset, 2005), having mothers imagine separation from their infants (Taubman-Ben-Ari & Katz-Ben-Ami, 2008), and completing a fear of intimacy scale vs. a control scale (Taubman-

Ben-Ari, 2004). This research suggests interpersonal relationships serve important terror management functions.

According to TMT, self-esteem functions to shield people from existential anxiety. Thus, much of human behavior is concerned with maintaining self-esteem, and as research testing the DTA hypothesis suggests, when these psychological structures (e.g., cultural identifications, important beliefs, bases for self-esteem and relationships) are threatened or weakened, thoughts of death become temporarily more accessible. An understanding of how people cope with self-esteem threatening events is therefore paramount. One-way people cope with such events may be with certain preparation strategies that help them anticipate and control events, leading them to a better performance, which would then bolster their self-esteem. Defensive pessimism and strategic optimism (Norem & Chang, 2002) suggests that pessimists and optimists use very different strategies to prepare for performance situations. Before delving into the defensive pessimism research I first review some basic findings regarding optimism and pessimism.

Optimism reigns over pessimism

Most people would probably agree that an optimistic outlook is better than a pessimistic one. Indeed, there is a plethora of research supporting this notion. When individuals think about their future, they tend to be biased and unrealistic (Taylor & Brown, 1988). In one of the earliest studies demonstrating this idea Weinstein (1980) simply had participants read a list of 18 positive and 24 negative life events. The participants were instructed to estimate the likelihood

that each event would occur for them and for the average (same sex) student. The results demonstrated a clear optimistic bias: Participants rated their own chances of experiencing a positive event well above average and experiencing a negative event as well below average compared to other fellow students. This type of unrealistic optimism is a key predictor of an individual's level of mental health, such that those who are more accurate about forecasting future events tend to be depressed or have low self-esteem (Ruehlman, West, Pasahow, 1985). A rosy outlook on life is not solely limited to mental health; rather there is substantial evidence linking optimism with benefits to physical health as well (for a review see Rasmussen, Wrosch, Scheier, & Carver, 2006). Succinctly, when confronted with adversity, optimists feel negative emotions (e.g., anger or depression), but also a sense of eagerness to persevere, which ultimately they use as a coping mechanism to overcome the adversity (Scheier & Carver, 2003). In contrast, pessimists feel a sense of doubt, and give up in response to the adversity. In addition optimists tend to experience more positive emotions in response to such hardships whereas pessimists experience more negative emotions (Carver & Scheier, 1990).

Numerous studies have demonstrated optimism as an important coping mechanism in different health domains (Scheier & Carver, 2003). In one study consisting of men who had coronary artery bypass surgery, those who were more optimistic reported less hostility before the operation, more relief, greater satisfaction with the medical care they received, and were more engaged in physical exercise six months after the operation (Scheier et al., 1989). In another

study examining optimism and physical health Trunzo and Pinto (2003) looked at early stage breast cancer survivors and found that optimism was associated with less emotional distress six months after treatment, particularly among women who experienced social support. Similar results have been found for women with postpartum depression (Carver, Gaines, Fontaine, & Jones, 1997). This research demonstrated that optimism was negatively correlated with depression, both during pregnancy and after childbirth. Overall, empirical evidence suggests that being optimistic is an important determinant in both mental and physical health.

Defensive pessimism and strategic optimism

At first blush it appears that optimism is more adaptive than pessimism because optimistic people cope better in response to health adversities and experience less mental health problems (e.g., depression). However, the picture may be more complicated. Research conducted by Julie Norem (2008) suggests that some people benefit from self-regulation through defensive pessimism. She defines defensive pessimism as:

> a strategy anxious individuals use to pursue goals: These individuals set unrealistically low expectations and then devote considerable energy to mentally playing through or reflecting on all the possible outcomes they can imagine for a given situation…. defensive pessimism is contrasted with strategic optimism, which refers to a strategy whereby individuals set optimistic expectations for their own performance and actively avoid extensive reflection. (Norem & Chang, 2002, pp 996)

Defensive pessimism and strategic optimism differ from other forms of pessimism and optimism in that they are domain specific and malleable (Norem, 2001). An individual may use defensive pessimism in an academic domain for instance, however in a more recreational domain such as tennis they may be more aschematic (i.e., use a combination of both strategies). In addition, a strategy can change. Someone may originally adopt a defensive pessimist strategy because they feel particularly anxious about specific events. If those events occur more frequently, and the individual becomes more habituated to the anxiety from those events, then their strategy may become more optimistic. Trait optimism and pessimism in contrast apply to a variety of circumstances, are generally stable over time, and are partially inherited (Scheier, Carver, & Bridges, 1994).

According to Norem (2008), defensive pessimists feel more comfortable using negative thinking, and when asked to prepare like strategic optimists they actually perform worse; however when defensive pessimists prepare with their preferred strategy there is no difference in performance compared to strategic optimists. Likewise, when strategic optimists prepare by setting low expectations and think about possible outcomes their performance suffers. Early research by Norem and Cantor (1986) supported these ideas. In one study, prior to a line-tracing task, defensive pessimists and strategic optimists were asked to report their level of anxiety, their expectations about their upcoming performance and the amount of control they felt about their upcoming performance. Although defensive pessimists reported greater anxiety, lower expectations, and less control prior to the task compared to strategic optimists, there was no difference in

performance between the two groups. A follow up study showed that when defensive pessimists were encouraged to do well they performed worse on a line-tracing task, compared to defensive pessimists that were not encouraged. There were no differences between encouraged and non-encouraged strategic optimists.

Similar findings regarding preparation and performance were obtained in a study conducted by Spencer and Norem (1996). Defensive pessimists or strategic optimists played darts for three minutes. Before playing, however, they were randomly assigned to one of three imagery conditions: a coping imagery condition, a mastery imagery condition or a relaxation condition. In the coping imagery condition participants listened to a 10-minute audiotape that suggested thinking about possibly missing targets and correcting for mistakes. This type of imagery was designed to cater to the preparation strategy used by defensive pessimists, such that defensive pessimists think about what might go wrong and prepare for such setbacks so they do not occur. If setbacks do occur they adjust and compensate for them so they will not occur in the future. In the relaxation condition participants still listened to a 10-minute audiotape; however the contents included imagining sensations and a soothing environment, and completely ignored information about darts. This type of imagery was designed to cater to the strategy used by the strategic optimists, such that these individuals do not prepare through careful mental preparation, but through distraction and relaxation methods. The mastery imagery condition was a 10-minute audiotape that focused on perfection, and was not designed to cater to either defensive pessimists or strategic optimists. Spencer and Norem (1996) predicted that

participants would perform best when using a congruent preparation strategy. The results were in line with the predictions; whereas defensive pessimists made more sequential shots (i.e., shooting for a one first, then a two and so on. Participants could not move onto the next number until correctly hitting the previous number) in the coping imagery condition than in the relaxation imagery condition and mastery condition, strategic optimists made more sequential shots in the relaxation imagery condition than in the coping imagery condition and mastery condition. Thus, both groups maximized performance when they prepared according to their comfortable self-regulatory strategies.

Research has also examined defensive pessimism and strategic optimism with reported mood and anxiety (Norem & Illingworth, 1993). In this study, defensive pessimist and strategic optimist participants were assigned to either a thought listing or distraction condition prior to completing a mental arithmetic test ostensibly designed to measure ability and aptitude. The thought listing condition was designed to mirror the strategy used by defensive pessimists, and instructed participants to write down possible outcomes, both positive and negative, and what would be the most likely outcomes. The distraction condition, on the other hand required attention, but without thinking about the arithmetic test to follow, and was designed to mirror the preparation of a strategic optimist. After the manipulation, but before the arithmetic test, all participants completed a profile of mood states scale as well as a state anxiety measure. Defensive pessimists given the thought-listing task showed less anxiety than defensive pessimists given the distracter task, whereas the inverse was found for strategic optimists. Likewise,

defensive pessimists reported feeling worse in the distracter condition relative to the thought listing condition. Again the inverse was found for strategic optimists.

In a related vein Sanna (1998) examined mood, but as it relates to the type of counterfactual thinking done by defensive pessimists and strategic optimists. Sanna suggested that defensive pessimists generate more upward pre-counterfactuals, which are pre-outcome thoughts used to facilitate preparation (e.g., "if only I had more study time; I could do better on tomorrow's exam"). These types of cognitions stem from negative moods and are similar to defensive pessimists setting low expectations (Sanna, 1996). Strategic optimists however, generate more downward counterfactuals, which stem from positive moods. Sanna (1998) predicted defensive pessimists would benefit from a negative mood induction, since activation of that mood state would generate more upward pre-counterfactuals, which would facilitate their performance. Participants watched video clips of humorous films, sad films, or no films (control), and after a brief delay, engaged in a counterfactual thinking task about their upcoming performance on an anagram task. Participants then attempted to solve 20 anagrams in a period of nine minutes. Results showed that defensive pessimists generated more upward pre-counterfactuals when placed in a negative mood or control mood relative to a positive mood, and solved more anagrams when placed in a negative mood. Strategic optimists completed more anagrams when placed in a positive mood relative to a negative mood. This research suggests mood influences thought preparation, which in turn affects performance.

Defensive pessimism and strategic optimism research has come outside of the laboratory as well (Norem & Illingworth, 1993, Study 2). This research looked at graduate nursing students across three phases. In the first phase, participants completed personality measures assessing whether they were a defensive pessimist or strategic optimist and were asked to list five life tasks or goals they were currently working on. In phase two, all participants completed activity reports related to experienced affect and control when their pagers signaled them to do so. Pager signals occurred four times a day for one week. In addition, half of the participants were assigned to either a progress condition or a no progress condition. In the progress condition participants rated their progress toward the first three of their goals they had listed in phase one. This manipulation was designed to get participants to reflect on and think about the future. In the final phase, a week after phase two, participants indicated how satisfied they currently were with their life and how much progress they felt they made on their life tasks. Norem and Illingworth predicted that reflection would facilitate defensive pessimists goals and life tasks, but hinder strategic optimists goal and life tasks. The researchers reasoned that reflection increases the likelihood of thinking about negative outcomes, which creates anxiety. This process allows defensive pessimists to accommodate for shortcomings in their goals and use that anxiety as motivation. Strategic optimists however find such negative thoughts worrisome to the point where goal directed behavior becomes more difficult. Findings indicated reflection led defensive pessimists to feel more control than strategic optimists, where the opposite was true when there was no

reflection. Moreover, defensive pessimists who reflected felt significantly more positive than defensive pessimists who did not engage in reflection. And finally, strategic optimists who reflected felt they had made less progress on their goals compared to optimists who did not engage in reflection.

The research reviewed thus far has examined defensive pessimism and strategic optimism in academic related domains (e.g., Sanna, 1998) and recreational domains (e.g., Spencer & Norem, 1996). Another domain defensive pessimism and strategic optimism applies to is social interaction. Since social situations can often be anxiety provoking and warrant a certain degree of preparation in order for successful outcomes to occur they can be studied from the perspective of defensive pessimism and strategic optimism. Showers (1992) examined social interaction with defensive pessimists and strategic optimists in two studies. In a first study, Showers demonstrated that when defensive pessimists focused on negative outcomes they talked longer with a confederate than defensive pessimists who focused on positive outcomes. In addition, confederates rated the conversation as going more smoothly when defensive pessimists focused on negative outcomes relative to focusing on positive outcomes. In a second study Showers found that defensive pessimists had higher expectations regarding an upcoming conversation with a stranger under negative self-focus relative to when they were under positive self-focus. In this study negative self-focus was manipulated using six statements regarding the upcoming conversation and participants rated the likelihood that each would occur (e.g., “I can’t think of anything to say”). Positive self-focus was manipulated in the same

manner except the statements were uniformly positive. The same pattern was observed for negative self-focus defensive pessimists regarding how in control they felt of the upcoming conversation, albeit marginally significant.

Defensive pessimism and strategic optimism as terror management mechanisms

Although defensive pessimism and strategic optimism may not be considered worldviews or bases of self-worth, defensive pessimism and strategic optimism help an individual regulate their behavior to meet cultural standards of value. Thus, they can serve a terror management function in that they facilitate meeting standards for attaining self-esteem. As an example consider individuals who endorse academic achievement as a way to earn self-esteem. How they prepare for exams is a key component to whether or not they perform well. They may use a defensive pessimistic strategy and set low expectations for performance, imagine failing the upcoming exam thereby studying harder to prevent such failure. They may think of possible questions the professor might ask (e.g., She didn't review this in lecture, but it's mentioned in the book a lot, I should make sure I know it just in case) or what to do if they come to a question they do not know during the exam (e.g., I don't think this was covered anywhere, it's ok, it's only one question and I know most of the material). With such strategic preparation, the defensive pessimist uses their anxiety as motivation. A strategic optimist can also do well on an exam, albeit with a different preparation strategy. They would expect to do really well and avoid thinking about possible questions on the exam. If they came to a question they didn't know they would

forget about it and continue to maintain their positive outlook. The preparation strategies from both camps are quite different, but each one allows for anxiety to be managed so that it does not interfere with performance.

The present study

The present study examines the DTA hypothesis with defensive pessimism and strategic optimism in a social situation, specifically public evaluation. According to the symbolic interactionists (e.g., Cooley, 1902), people come to see themselves, at least in part, from the perspectives of others. This process, in turn, leads people to evaluate themselves based on the feedback they receive from others. Likewise TMT suggests that cultural worldviews and self-esteem are fragile social constructions that need to be validated by feedback from others to seem "real". One's self-esteem is therefore contingent on positive feedback from other individuals that one is living up to cultural standards (i.e., other people provide much needed validation for our sense of self-esteem). To create a scenario in which one's self-esteem would be tenuous and in need of validation from others, I had social defensive pessimist and social strategic optimist participants believe that they would have to deliver an impromptu speech to their fellow participants. Believing that one will have to give a speech in front of one's peers should be highly threatening to participants' self-esteem because of possible failure and negative public evaluation. Indeed, this procedure has been shown to increase DTA in past research (e.g., Hayes et al., 2008).

In keeping with prior defensive pessimism research (e.g., Spencer & Norem, 1996), I manipulated how participants would prepare for the upcoming

speech. Preparing with a defensive pessimist strategy would include setting low expectations and thinking about various possibilities and situations related to the upcoming event, whereas preparing with a strategic optimist strategy would include setting high expectations and distracting oneself before the impending performance. Although the threat of having to give a speech should heighten DTA in all participants, when defensive pessimists prepare using a defensive pessimist congruent strategy their DTA is predicted to dissipate compared to defensive pessimists that prepare using an incongruent strategy (i.e., prepare like a strategic optimist). This prediction is based on the idea that preparation presumably lowers their DTA and keeps their goal directed behavior on track so they do not become overwhelmed with anxiety. Thus, although defensive pessimists may experience some anxiety as they think about what could go wrong, this strategy helps them maintain control and keep anxiety at a manageable level. In a sense, defensive pessimists manage anxiety through harnessing that anxiety and using it as motivation to achieve a desired goal (Norem, 2008). Because there is no clear association between anxiety and DTA (e.g., Schimel et al., 2007) and DTA is sought to be associated with a wide range of defensive behaviors (e.g., Hayes et al., in press), the anxiety experienced by defensive pessimists in the congruent condition should be motivating and unrelated to DTA. Likewise, when strategic optimists are instructed to use the strategic optimist congruent strategy they should have lower DTA than those instructed to use the defensive pessimist congruent strategy, since they keep anxiety low through setting high expectations, and avoiding preparation. In addition, using a congruent strategy (e.g., defensive

pessimists using a pessimistic strategy) should increase expectations regarding success[1], increase perceived control, and increase feelings of preparation for their upcoming performance relative to using an incongruent strategy.

Method

Participants and design

Participants were 95 introductory psychology students at the University of Alberta. Of the 95 participants, seven were excluded because they didn't follow instructions (i.e., either not preparing with the strategy given to them or not completing the DTA measure with the first word that came to mind), and eight were excluded due to suspicion about the speech. This left 80 participants for data analysis , 40 of which were defensive pessimists and the other 40 were strategic optimists[2]. Six men and 31 women were given defensive pessimism congruent instructions, and 11 men and 23 women were given strategic optimist congruent instructions. Nine participants did not report their gender. In addition, 33% of the sample were Caucasian, 15% were Asian, 14% were European, 8% Other, and 21% did not report their ethnicity.

Participant eligibility was determined with the revised defensive pessimism questionnaire (Norem, 2002), which was completed during a mass testing session earlier in the semester. This method of selection was used in order to pre-screen participants as either social defensive pessimists or social strategic optimists. The revised defensive pessimism questionnaire consisted of seventeen items total, with four items being filler items that were not scored. Thirteen items measured a person's propensity to use defensive pessimistic or strategic optimistic

strategies in social settings. Questions were rated on a seven-point scale, in which higher ratings indicated greater agreement with the item. For example, agreeing with the statement "I generally go into social situations with low expectations, even though I know things will usually turn out alright" would indicate a defensive pessimistic style, whereas agreeing with the statement, "Prior to social situations, I avoid thinking about possible bad outcomes" would indicate a strategic optimistic style. The item, "I have generally done pretty well in social situations in the past" was used to determine whether or not their style is successful. Presumably, this item separates defensive pessimists from real pessimists. Real pessimism entails expecting the worst, and rather than preparing for those events so that they do not transpire (i.e., using defensive pessimism) an individual sets up a self-fulfilling prophecy and gets the worst. Following past research, only participants agreeing with this item at a 5 or greater were eligible to participate (e.g., Sanna, 1996). Scores were calculated by summing their endorsements for the 12 items, with two items being reversed scored. Higher scores indicated greater defensive pessimism. The top 100 scores from the upper quartile of the distribution made up eligible defensive pessimists, and the low 100 scores from the lower quartile of the distribution made up eligible strategic optimists [3]. Defensive pessimists and strategic optimist participants were randomly assigned to either the defensive pessimism congruent instructions condition or the strategic optimism congruent instructions condition yielding a strategy (defensive pessimist vs. strategic optimist) X instructions (defensive pessimism congruent vs. strategic optimism congruent) between-subjects design.

Participants were run in groups ranging from 2 to 4, by a female experimenter. The experimenter was blind to participants' strategy (i.e., whether they were a pessimist or optimist) as well as the instructions given.

Materials and procedure

On arrival, participants were greeted by the experimenter and given a brief cover story indicating that the study was looking at the relationship between personality traits and verbal comprehension. The experimenter explained that the study consisted of two parts, the first being an examination of trait conscientiousness, and the second being a measure of verbal comprehension, in which an individual due to arrive shortly would deliver a speech, after which participants would be asked questions regarding its contents. The experimenter casually mentioned while delivering the instructions that the speech-giver should have arrived by now, but that they were probably just running a bit late. However in reality, there would be no speech and there was no speech-giver due to arrive.

After delivering these general instructions, the experimenter ushered the participants into private cubicles and administered the initial personality packet, instructing them to crack open their door when finished with the packet. The personality packet consisted of two filler measures, the need for cognition scale (Haugtvedt & Petty, 1992) and the self-monitoring scale (Snyder, 1974). These materials were used solely to mask the cover story and were not used in any data analyses. A few minutes after all the participants had finished the packet and opened their cubicle door, the experimenter could be heard pacing up and down the length of the hallway adjacent to the cubicles. The experimenter then opened

the main door to the laboratory a few times and looked outside, gave a sigh, and then made a call on her cell phone. Participants overheard the experimenter say the following, “Hi, It’s me. No. They aren’t here yet, what should I do? Okay [pause] okay [pause], thanks, bye”. Following the scripted phone conversation, the experimenter entered each cubicle closing the door behind her.

All participants were told by the experimenter that the person designated to give the speech was missing. Thus, after she had talked with her supervisor, it was decided that the person in cubicle A, B, C, or D depending on which cubicle the participant was in, would deliver the speech. The experimenter therefore asked each participant if they would give the speech. After participants agreed to deliver the speech (all participants agreed to do so) the experimenter explained that there was a certain set of instructions that the person who was going to deliver the speech would have prepared with, and that they should read over the speech first, and then go through the instructions. The speech was a 376-word essay on how to classify volcanoes.

The set of instructions participants were given made up the independent variable. In the defensive pessimism congruent condition participants were instructed to first set very low expectations about their upcoming performance (i.e., expect not to do well). Participants then answered a few questions that were designed to mimic how defensive pessimists prepare for social situations. Specifically, participants were asked what they think will happen as they deliver the speech to the other participants, what the best and worst possible outcomes might be, what the most likely outcomes will be, how they may feel in the event

of the best and worst possible outcomes, and any other possible outcomes that may occur (e.g., Norem & Illingworth, 1993). When they were finished they were instructed to open their cubicle door. Participants in the strategic optimism congruent condition were instructed to first set very high expectations about their upcoming performance (i.e., expect to do well). Participants in this condition were further instructed to not think about giving the upcoming speech, but instead just relax and stay positive. In order to facilitate this form of mental preparation, they were then instructed to work on a find the difference task, where they saw a series of two cartoons per page that look very similar, but have slightly different features. They simply had to circle the differences between each of the two cartoons presented. They were told to complete as much of the packet as possible and not to worry if they do not finish because the experimenter would come in and get them. If they did complete all of the cartoons, they were instructed to open their cubicle door so the experimenter knew they were finished.

The experimenter entered the cubicle for a final time, indicating that there was just one last packet to fill out. Participants were instructed to complete two quick measures, and when finished crack their door and at that point they would deliver the speech to the other participants. The first measure was the primary dependent variable of the study, which was the measure of DTA. DTA was measured with a word-fragment completion task (e.g., Schimel et al., 2007) consisting of 20 word-fragments, six of which could be completed with a death word or a neutral word. For example, one fragment consisted of the letters *COFF_ _* and could be completed as *COFFEE* or the death-related word

COFFIN. The possible death-related words were *buried, dead, grave, killed, skull,* and *coffin.* The remaining fragments could only be completed as neutral words.

On the following page, participants rated the extent to which they agreed with four statements on a 9-point scale (1 - *strongly disagree;* 9 - *strongly agree)*: The items were designed to measure participants' level of optimism (I have high expectations about my performance), perceived control (I feel in control of my upcoming performance), preparedness regarding the speech (I feel prepared to give the speech), and to check the effectiveness of the instruction manipulation (I followed the instructions preparing to give the speech). When all participants were finished with the last measure the study was concluded. Participants were told they would not have to give a speech, were probed for suspicion and fully debriefed.

Results

Death-thought accessibility

Participants' gender was examined and found to have no influence; therefore this variable will not be discussed in further detail. Death-thought accessibility scores were computed by summing the number of fragments participants completed as a death word. To test the main prediction, this measure was submitted to a 2 (defensive pessimist vs. strategic optimist) X 2 (defensive pessimism congruent instructions vs. strategic optimism congruent directions) analysis of variance, which revealed a significant interaction, $F(1, 76) = 4.32$, $p < .05$. Given that I had a-priori predictions, contrast weights of 1 were assigned to defensive pessimists given congruent instructions and -1 to defensive pessimists

given incongruent instructions. The same was done for strategic optimists. The former analysis revealed no significant difference between defensive pessimists given congruent instructions vs. incongruent instructions, $t < 1$, whereas the latter analysis revealed that strategic optimists given congruent instructions had significantly lower DTA than strategic optimists given incongruent instructions, $t(76) = 2.01$, $p < .05$. Table 1 displays the mean DTA for defensive pessimists and strategic optimists by condition.

Expectations, Control and Preparedness

There was a marginal main effect of instructions on how well participants expected to do giving the speech, such that participants given the defensive pessimist congruent instructions reported somewhat lower expectations than participants given the strategic optimist congruent instructions, $F(1, 76) = 3.04$, $p = .08$ Planned contrasts revealed no significant difference between defensive pessimists given congruent instructions vs. incongruent instructions in regards to their expectations about their performance, $t < 1$, however strategic optimists given congruent instructions expected to perform significantly better than strategic optimists given incongruent instructions, $t(76) = 2.38$, $p < .01$. There were no significant effects for the items measuring perceived control and preparedness.

Instructions

There was a marginal interaction regarding the item "I followed the instructions preparing to give the speech", $F(1, 76) = 3.12$, $p = .081$. Planned contrasts revealed no significant difference between defensive pessimists given

Table 1

Mean DTA for the interaction of self-regulatory style by condition

Condition	Defensive pessimists	Strategic optimists
Defensive pessimism congruent instructions	2.25 (.91)	2.4 (.94)
Strategic optimism congruent instructions	2.55 (1.1)	1.75 (1.1)

Note: Higher numbers represent greater DTA. Standard deviations are presented in parentheses.

congruent instructions vs. incongruent instructions as to how they followed instructions, $t < 1$. However strategic optimists given congruent instructions reported following instructions significantly more than strategic optimists given incongruent instructions, $t(40) = 2.16$, $p < .05$. The means for expectations, control, preparedness and instructions by condition are presented in Table 2 for defensive pessimists and Table 3 for strategic optimists.

Discussion

The present study adds to the terror management and strategic optimism literatures by showing social strategic optimism serves a terror management function. Strategic optimists under self-esteem threat given instructions mimicking their preparation strategy showed lower DTA than strategic optimists given instructions mimicking defensive pessimists preparation strategy. Strategic optimists also had higher expectations about their performance when given their congruent preparation (vs. defensive pessimist congruent instructions), indicating that congruent instructions were consistent with their strategy and made them more optimistic about their supposed upcoming performance. Finally, strategic optimists using their congruent strategy were more likely to report following instructions to prepare for the speech relative to strategic optimists given defensive pessimist congruent instructions. This suggests that the manipulation did indeed cater to strategic optimists style of preparation, since those given incongruent instructions were more reluctant to follow the instructions designed to cater to defensive pessimists.

Table 2

Means for expectations, control, preparedness, and instructions as a function of condition and defensive pessimist strategy.

Condition	Expectations	Control	Prepared	Instructions
Defensive pessimism congruent instructions	6.4 (2.21)	6.0 (2.18)	5.5 (2.01)	8.3 (.923)
Strategic optimism congruent instructions	6.45 (2.04)	6.0 (2.01)	5.6 (2.01)	8.2 (1.01)

Note: Higher numbers represent greater expectations, control, preparedness, and following of instructions. Standard deviations are presented in parentheses.

Table 3

Means for expectations, control, preparedness, and instructions as a function of condition and strategic optimist strategy.

Condition	Expectations	Control	Prepared	Instructions
Defensive pessimism congruent instructions	5.45 (1.67)	6.2 (2.35)	5.5 (2.41)	8.05 (1.01)
Strategic optimism congruent instructions	6.85 (1.42)	7.0 (1.93)	6.35 (1.9)	8.7 (.656)

Note: Higher numbers represent greater expectations, control, preparedness, and following of instructions. Standard deviations are presented in parentheses.

Despite these findings, there are obvious limitations. The most pressing issue concerns the defensive pessimists. Defensive pessimists did not seem to benefit from congruent instructions in any way. I will address some possible reasons why this may have happened in the following section. Next I discuss future research directions for defensive pessimism and strategic optimism with TMT and conclude with a brief discussion of the possible benefits and drawbacks of each strategy from a terror management perspective.

Why did defensive pessimists still have high DTA?

Defensive pessimists' level of DTA remained high when they prepared with congruent instructions, but strategic optimists DTA dissipated to a low level when they prepared with congruent instructions. There are three possible reasons this may have happened. The first possibility comes from the idea that defensive pessimists may have higher DTA in general compared to strategic optimists; the second possibility comes from the idea that anxiety experienced by the defensive pessimists kept their DTA high in both conditions, and the third possibility has to do with the manipulation of the defensive pessimism congruent instructions. I discuss each one in turn.

DTA in the traditional sense of the DTA hypothesis should not be aroused unless either a self-esteem domain or worldview comes under threat. Although research has supported this with several studies (see Hayes et al., 2010 for a review), research has also shown that DTA is higher for certain individuals with certain personality traits in the absence of any threat. One such personality trait is self-regulation or self-control (Gailliot, Schmeichel, & Baumeister, 2006). These

researchers suggest that self-regulation, which is the ability to control thoughts and behaviors, is an important component of keeping thoughts of death suppressed, and since thoughts of death are anxiety provoking, individuals higher in self-regulation should have lower DTA at baseline than individuals lower in self-regulation. Research conducted by Gailliot et al. found support for this notion showing that lower self-regulation was negatively correlated with DTA on a word stem completion task. A similar pattern was found with an ambiguous picture that could be interpreted as a death-related image or neutral image, such that participants lower in self-regulation reported seeing the death related image more often than the neutral image. Finally, individuals lower in self-regulation reported a greater fear of death than those high in self-regulation. This research suggests that thoughts of death are more accessible and difficult to suppress for those lower in self-regulation.

Despite DTA being more accessible for low self-regulation individuals compared to high self-regulation individuals, there is no evidence that defensive pessimists are generally lower in self-regulation than strategic optimists. However, it is possible that under conditions of threat, defensive pessimists consume more self-regulatory resources in thinking through all possible outcomes, which leads to higher DTA. Another possibility is that defensive pessimists are generally more neurotic and have lower self-esteem than strategic optimists. Indeed, research has shown a positive correlation of .27 between neuroticism and social defensive pessimism (Illingworth & Norem, 1991), and these variables may likely be associated with higher levels of DTA. If as TMT

suggests, a cultural worldview keeps thoughts of death at bay when an individual believes in and feels secure in their worldview, then a person who holds a more precarious worldview may have higher DTA on a day-to-day basis. Thus, worldview insecurity may be a predictor of DTA. From the perspective of TMT, this type of insecurity is manifested in neuroticism (Pyszczynski, Solomon, & Greenberg, 2003). Neurotic individuals have trouble finding meaning and purpose in life; hence they inadequately manage their death anxiety. Research conducted by Arndt and Solomon (2003) illustrates this point. These researchers found that individuals high in neuroticism, who were suggested to have trouble sustaining faith in their worldview, desired less control after MS because they lack confidence to be autonomous in their worldview. Relating this back to defensive pessimism, it is possible that defensive pessimists' neuroticism may lead to high DTA relative to their strategic optimist counterparts, and that their neuroticism may have prevented them from feeling in control of their upcoming performance regardless of what type of instructions they were given.

In addition to reporting greater neuroticism than strategic optimists, defensive pessimists also report lower self-esteem (Campbell et al., 1996; Norem, 2002). From the perspective of TMT, self-esteem is something people actively pursue in order to buffer existential fear. Self-esteem is contingent on successful outcomes and how satisfied one is with meeting the standards of their worldview. People's self-esteem rises and falls to the extent that they successfully meet the standards prescribed by their worldview. Therefore it is quite likely that individuals who are not meeting standards of their worldview have low self-

esteem, and as a consequence higher DTA. Recent research from Routledge, Ostafin, Juhl, and Sedikides (in press) offers some support for this idea. The researchers simply had participants complete a measure of self-esteem, followed by a measure of DTA, followed by a measure of meaning in life, and finally a measure of affect. The results indicated that low self-esteem participants had higher baseline levels of DTA, and that DTA was negatively correlated with meaning in life, and positively correlated with negative affect. There were no significant relationships for high self-esteem participants. These results suggest defensive pessimists lower self-esteem may be partly responsible for why their DTA did not dissipate even when given the defensive pessimist congruent instructions.

Although the aforementioned ideas are tenable because they draw from empirical evidence, I am skeptical that defensive pessimists' DTA comes from low self-esteem and a lack of meaning in life. Rather, if defensive pessimists' DTA is greater at baseline than strategic optimists it is likely from their unrealistic expectations about their performance. In other words, even after doing well they may still not be satisfied with their performance, thus their DTA would stay static. One study from Norem and Cantor (1986) supports this idea. As mentioned previously in the introduction, this research showed that defensive pessimists performed just as well as strategic optimists in a line-tracing task. However after the task all participants were asked how well they thought they had done and how satisfied they were with their performance. There was no difference between defensive pessimists and strategic optimists as to how well they thought they had

done, but defensive pessimists reported they were significantly less satisfied with their performance than strategic optimists. This suggests that defensive pessimists may set low expectations as to how well they should perform, but even after a successful performance derive little satisfaction from what they achieved. Perhaps because their preparation is so intense, they feel their performance should be nothing but stellar. And since they fail to derive satisfaction from their performance, it is possible that their self-esteem remains low and DTA remains high. At this point it is tempting to conclude that defensive pessimists have higher DTA at baseline levels, hence they would be unaffected by the manipulation of congruent instructions. However without a control condition (e.g., some participants could have been told they don't have to give a speech; Hayes et al., 2008), this conclusion cannot be drawn and awaits further research.

Another possibility for defensive pessimists DTA may not be related to the defensive pessimists personality (e.g., neuroticism) per se, but to the strategy of defensive pessimism. Defensive pessimism involves harnessing anxiety as motivation (Norem, 2001) via reflecting on negative outcomes and setting low expectations. Because this kind of preparation uses anxiety as its driving force, there is reason to believe that prior to a performance, defensive pessimists' DTA would remain high, and that it would dissipate after a successful performance. The results of the present study fit this post hoc hypothesis because no performance actually took place. In fact, future research could examine DTA again prior to a performance measure with defensive pessimists and if both groups

still have high DTA with both strategies, but defensive pessimists perform better using their congruent strategy then that would fit this reasoning.

The last possibility generated for the finding of high DTA among defensive pessimists may have been due to how the strategy was manipulated. The defensive pessimist congruent instructions asked participants to generate positive and negative outcomes, likely outcomes and how they might feel if those outcomes were to occur. Though this manipulation is consistent with how defensive pessimists prepare for self-esteem threat and inconsistent with how strategic optimists prepare, there is reason to believe it may not have encompassed a defensive pessimist strategy fully. In other words, the manipulation may not have been strong enough. The manipulation failed to include how one should compensate for mistakes should they occur, which is an integral part as to how a defensive pessimist prepares. It is not enough to imagine negative scenarios, one must imagine how they will deal with them should they arise. For instance Spencer and Norem (1996) had a condition designed to facilitate defensive pessimists' performance. This condition included imagining correcting for mistakes during a dart throwing task: "Note the pressure change in your hand as you release the dart. Hear the sound that it makes. You missed the target to the left. As you take another dart notice the feel, and adjust the balance of the dart in your hand." (Spencer & Norem, 1996, p. 359). Thus, if the manipulation had included questions about adjusting for mistakes in performance; there is reason to believe it would have been more potent. For example, questions such as *write down how you might compensate for any negative things should*

they arise while you deliver the speech, or how might you attain any positive outcomes would help participants think of how to adjust for mistakes, thus lowering their anxiety if it arises during performance. A defensive pessimist may think of what they would do if they read the speech too quickly, or jumbled a few words, or if the other participants looked at them with a blank stare. Indeed this is akin to defensive pessimistic preparation: Thinking of negative events and planning ahead so that those events do not occur. Future research should include possibilities such as correcting for mistakes and examine whether this affects DTA on defensive pessimists given a congruent strategy relative to an incongruent strategy.

An equally puzzling result regarding the defensive pessimists concerns the questions after the DTA measure examining expectations, control and preparedness. Despite being given congruent instructions, defensive pessimists displayed no significant differences in these measures compared to defensive pessimists given incongruent instructions. Strategic optimists reported significantly higher expectations when given their congruent strategy, and the means for how much control they felt on their upcoming performance and how prepared they were for their upcoming performance were in the right direction, although non-significant. The defensive pessimists' means were nearly identical in all cases. As with DTA, these findings could be due to the manipulation used; the defensive pessimist congruent instructions did not have participants compensate for things that may go wrong as they deliver the speech, and as a consequence they felt less prepared and less in control. It is not too surprising

there was a marginal main effect for condition on expectations, given that participants in the strategic optimist congruent instructions were told to set high expectations.

In fact, what was more surprising was that defensive pessimists' expectations were somewhat higher than would be expected from past defensive pessimism research. As Norem and Cantor (1986) found, defensive pessimists had much lower expectations than strategic optimists regarding an upcoming task. These inconsistencies in the present study may be due to that fact that DTA was measured beforehand, possibly affecting the subsequent questions about preparing for the speech. As to how these questions may have been affected, I can only speculate, but there is evidence that measuring DTA before other items of interest can potentially confound results (Hayes et al., in press). For instance, it is thought that measuring DTA can cause thoughts of death to become conscious, since participants are actively filling in letters of an incomplete word with a death word. This process in turn can affect subsequent measures because death thoughts are possibly conscious, and as terror management research has shown, thoughts of death then become suppressed from consciousness and after a delay lead to worldview defense and self-esteem striving. Applying this reasoning to the present research, it is possible that DTA became conscious, and once it did there were downstream effects of suppression interfering with how participants thought about the upcoming speech. Perhaps in their suppression efforts participants avoided thinking about anything aversive, which would have included the speech, and underestimated their perceived level of control and preparedness.

Future directions for research

The present study was a first step in examining defensive pessimism and strategic optimism with TMT. Yet as mentioned in the previous section there are several issues from the present study that need to be addressed. Future research can help address these issues while also examining other areas of defensive pessimism and strategic optimism research. One way this research can be expanded would be to examine a different defensive pessimist and strategic optimist domain, such as academic performance. Secondly, the present study failed to have a performance measure. The majority of defensive pessimism research looks at actual performance, not just forecasted performance as to how an individual thinks they will perform (e.g., Norem & Cantor, 1986; Spencer & Norem, 1996). In the following paragraph I discuss this proposed research in some detail.

As mentioned in the introduction defensive pessimism and strategic optimism is domain specific (Norem, 2002), and it would be more convincing to demonstrate defensive pessimism and strategic optimism as terror management mechanisms if a different domain yielded similar results as the present study. One specific domain that has been looked at with several defensive pessimism studies is academics (e.g., Norem & Cantor, 1986), and this would be the domain I would investigate in a follow-up study. It should be noted that academic achievement or intelligence as a contingency of self-worth may also need to be considered. The present study used a general self-esteem threat that presumably affects all participants, however past research using the DTA hypothesis has threatened

specific domains and contingencies (e.g., intelligence as in Hayes et al., 2008, Study 1). Therefore the most optimal design would include academic defensive pessimists and academic strategic optimists who hold (at least to some extent) academic achievement or intelligence as a domain of self-worth.

Participants would be brought into the lab and told they would be completing a couple personality measures as well as some cognitive tasks. All participants would be told they would complete a measure of ability and aptitude, which would constitute a potential self-esteem threat (e.g., Hayes et al., 2008). Prior to completing the test, participants would prepare in a manner similar to the present study, except that the defensive pessimist congruent instructions would include compensating for negative outcomes, as discussed previously. After each set of instructions the measure of DTA would follow. DTA could be measured either with a word stem completion task, as in the present study, or with a lexical decision task, such that faster reaction times to death words indicate higher DTA. This measure of DTA could help demonstrate convergent validity for DTA and its relationship to defensive pessimism and strategic optimism. Moreover this measure of DTA has been used in past research (e.g., Schimel et al., 2007). All participants would then take the test, but would not receive their actual score as to how they performed. Finally they would answer questions related to how well they thought they had done and how satisfied they were with their performance (e.g., Norem & Cantor, 1986). I would predict that defensive pessimists given their congruent strategy would perform better than defensive pessimists given their incongruent strategy; however both groups would still exhibit high levels of

DTA. The same pattern would be expected of strategic optimists except that DTA would be low for optimists given congruent instructions relative to incongruent instructions. In the design of the aforementioned study, there would also be one hanging control group of participants that receive a no-threat cognitive task. Defensive pessimist and strategic optimist participants in this control condition would be asked to take the same cognitive test, but it would be framed as unrelated to cognitive ability or aptitude. The addition of these control groups will allow me to determine whether the higher DTA displayed by defensive pessimists are likely due to high baseline DTA or being placed in the threatening situation.

Implications and conclusion

According to TMT self-esteem is a psychological need that human beings actively pursue to quell existential anxiety (Pyszczynski, Greenberg, Solomon, Arndt, & Schimel, 2004). We cannot give up the pursuit of self-esteem, although at times such an option would seem desirable if it could be done. A man doesn't approach a woman because he's afraid of rejection, a student doesn't take a more difficult class because they're afraid of failure, and an athlete does not take the game winning shot to avoid the possibility of failure. Indeed, the pursuit of self-esteem always carries the psychological baggage of potential failure. In order to minimize failure and maximize success, human beings prepare in ways that facilitate attaining their goals, which in turn alleviates anxiety that arises from those goals. Defensive pessimism and strategic optimism are two clear-cut examples of such preparation. The present research suggests that how individuals prepare for potential self-esteem threat is an important part as to how anxiety

from that potential threat is managed, particularly for strategic optimists. Defensive pessimists preparation did not seem to alleviate anxiety, but this is not to say that their self-regulatory style is worse than strategic optimists. Indeed the majority of the defensive pessimism literature shows that both groups perform equally well, and as mentioned previously more research would need to be conducted regarding DTA and defensive pessimism before making such a conclusion. In all likelihood both strategies have benefits and flaws, which I now turn to briefly from a terror management perspective.

Defensive pessimists experience more anxiety in general relative to strategic optimists (Norem, 2001). They then use this anxiety as motivation to help them prepare and pursue their goals, and although their style of preparation might seem insane to the average person, it helps defensive pessimists "get the job done". From a terror management perspective hectic preparation to attain self-esteem is less detrimental than someone who does not attain self-esteem. In other words defensive pessimists may experience some anxiety while attempting to pursue and attain self-esteem, but the fact that they are pursuing and attaining self-esteem is even more important for overall mental health. People who do not pursue and attain self-esteem tend to be depressed because they do not feel like meaningful contributors to their cultural worldview (Pyszczynski et al., 2003). According to prior research, anxious individuals who use a defensive pessimism strategy to deal with threatening tasks are more successful than anxious individuals who do not (Norem, 2008), suggesting that in the long run this strategy may be useful in providing defensive pessimists with self-esteem.

Strategic optimists generally avoid anxiety and pursue self-esteem without extensive preparation. They tend to perform as well as defensive pessimists, and they are not burdened with the extensive reflection and worry that defensive pessimists experience. It seems then that strategic optimism is a better strategy than defensive pessimism because self-esteem is attained with less anxiety. Yet there are likely instances when a defensive pessimist strategy may be more fitting to the situation than a strategic optimist strategy. I would suggest physical health threats in particular as one domain that may compromise strategic optimists' well-being.

In recent years TMT has been integrated with heath psychology and has accumulated a surprisingly large literature (for a review see Goldenberg & Arndt, 2008). In a nutshell, a health threat (e.g., if your parent has cancer you're equally likely to get cancer) often leads to conscious thoughts of death, which then leads individuals to engage in proximal defenses such as suppression to remove such thoughts from consciousness or action to reduce one's vulnerability toward the threat (e.g., If I eat more broccoli I'll be less likely to get cancer). Given that strategic optimists set very high expectations, avoid thinking about possible outcomes and prefer distraction compared to preparation they may not engage in the most constructive behavior to deal with health threats. They may simply suppress the threatening health information, thinking positively that they won't ever contract the disease. What is more, they may not prepare properly. For instance eating foods that may be healthier or having regular visits to the doctor. In contrast a defensive pessimist would likely deal with a health threat by

extensive preparation. Making sure they're eating properly and having an annual physical that screens them for any cancerous cells. I have not seen any research related to physical health and defensive pessimism, but it is tenable that defensive pessimists may be better suited to deal with health threats than strategic optimists. To wrap up, it is too early to tell if a particular strategy is more or less adaptive than the other, particularly from a TM perspective.

As it stands now, there is an abundance of terror management research that shows people strive for self-esteem after a brief contemplation of their own death (Pyszczynski et al., 2004) and research showing increased DTA after self-esteem threats (Hayes et al., in press). However little research has examined the preparation that goes into self-esteem striving. As I hope to continue this line of research, it will be exciting to explore further the relationship between DTA and self-esteem preparation disruption with defensive pessimism and strategic optimism.

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Footnotes

[1] Defensive pessimists generally set low expectations even when using their own strategy. However when using an optimist strategy they should have scores reflecting exceptionally low expectations and when using their own strategy they should have moderately low expectations. If this prediction is correct the difference between the two groups should be significant.

[2] Because of the nature of the threat roughly 20% of the sample was suspicious, which is too many if I were to exclude all of them. Therefore, I only excluded people based on suspicion regarding the speech into two categories. This first category pertained to participants given defensive pessimism congruent instructions. Because this condition told participants to "open their cubicle door when they were finished" and the speech giver would not have been in a cubicle, participants presumably used this information as evidence to believe there was no speech giver and that having them substitute as speech giver was part of the experiment. Three defensive pessimists and one strategic optimist reported this type of suspicion. The second category was participants who reported not believing the speech because they heard and paid attention to the experimenter when she was going in and out of cubicles. Participants presumably used this information as evidence suggesting that other participants were being told similar information regarding the speech. One defensive pessimist and two strategic optimists in the defensive pessimist congruent condition reported this type of suspicion during probing.

An additional eight participants were excluded because they failed to follow instructions. These participants were also excluded based on two categories. The first category included only strategic optimists in the defensive pessimist congruent condition. One participant reported not understanding the instructions during probing, another for not putting any answers to the questions regarding possible outcomes, and two participants for indicating a 4 on the item "I followed the instructions preparing to give the speech". The other category included participants who noticed death words during the DTA measure and actively avoided them or did not complete the measure with their first natural response. This category included two defensive pessimists and one strategic optimist given defensive pessimist congruent instructions as well as one defensive pessimist given strategic optimist congruent instructions.

Finally cell numbers were equal for each condition. In other words there were 20 defensive pessimists given incongruent instructions, 20 given congruent instructions and so on. During the semester when the study was run participants were given materials randomly. As time went on to ensure equal cells I monitored each condition and for a selection of participants (approximately eight) I looked to see what their strategy was and made sure they received a specific packet.

[3] Participants were selected from extreme ends of the distribution to ensure use of defensive pessimism and strategic optimism as a specific strategy in social situations rather than as an aschematic strategy which is a combination of both optimism and pessimism. This selection is necessary in order to test the specific hypotheses of the present research, such that individuals who prepare in a

defensive pessimistic manner or strategic optimistic manner do so in order to help alleviate anxiety from potential self-esteem threats. The present research is not interested as to how aschematic individuals prepare for potential self-esteem threats, and that is why those participants were not eligible to participate.