HOW DEATH GUIDES HUMAN BEHAVIOR

–

THE ROLE OF CULTURAL NORMS AND VALUES IN TERROR MANAGEMENT THEORY

DISSERTATION

zur Erlangung des akademischen Grades
eines Doktors der Philosophie (Dr. phil.)

eingereicht am Fachbereich Humanwissenschaften
der Universität Kassel

vorgelegt von
Dipl.-Soz. Simon Schindler
April 2014
(Datum der Disputation: 23.07.2014)

Dean of the Faculty of Human Sciences:	Prof. Dr. Heidemarie Möller
Supervisor:	Prof. Dr. Marc-André Reinhard
Thesis Reviewers:	Prof. Dr. Marc-André Reinhard
	Prof. Dr. Immo Fritsche
	Prof. Dr. Martin Hänze

Maybe death is just a thought.

Anyway, a very powerful one.

CONTENTS

PREFACE

At times, reflecting on my own life makes me wonder about what I really know about the person called Simon Schindler. What are the actual goals and motives that drive my behavior? Why do I care so much about what people might think of me? And why do I feel so much pressure once in a while to fulfill other people's expectations? Once, my mother told me that I was born with a blue head because the umbilical cord was so tightly wrapped around my neck that I was not able to breathe. So, the first lesson I might have learned was that life is fragile and can end very quickly. Although reading the works of Karl Popper have taught me that I will never know for sure to what extent this experience actually affected my life, this early event still offers an interesting perspective on the question of basic human motivational factors; namely, the role of death in life.

OVERVIEW

This dissertation consists of two main sections: the synopsis and an empirical section (see Appendix A to H). In the synopsis, the findings of the empirical section are summarized and interrelated by providing an overview of the relevant literature that is connected to the findings. In the empirical section, all studies that were conducted for this dissertation are reported in paper-based formats.

In the first part of the synopsis, basic assumptions of terror management theory (TMT) are displayed, especially focusing on the mortality salience (MS) hypothesis, meaning increased motivation of worldview defense and self-esteem striving after having been reminded of one's own death. Also, the role of group membership is explicated in this context. Based on the two types of reactions, in the next part I review TMT literature regarding specific cultural values and social norms, such as prosocial norms, values of materialism, religious values, the value of honesty, the norm of reciprocity, pro-environmental norms, and descriptive norms. Additionally, boundary conditions (such as group membership and norm salience) are explicated. Notably, despite the large amount of literature on TMT (including many review articles), no review so far has directly addressed specific values and norms. Finally, in the Discussion section, alternative perspectives of the role of groups and the function of self-esteem are offered. Related to that, I discuss anonymity as a potential moderator for MS effects. Furthermore, alternative approaches for MS effects are briefly mentioned, followed by a discussion on TMT perspectives on peaceful coexistence.

In the empirical section, eleven studies embedded in eight paper-based manuscripts are reported (the order here fits the order in the Synopsis). The first paper (Appendix A) deals with the role of group membership under MS when evaluating others. In one study, participants under MS are shown to display ingroup bias according to their perceived weight-based group membership. The second manuscript (Appendix B) focuses on the idea that harming and dominating others provides a source of self-esteem for people with a disposition

for everyday sadism. Accordingly, results indicated that everyday sadists punish cooperative individuals (i.e., antisocial punishment) more severely after being reminded of their own death. The next six manuscripts (Appendix C to H) focus on specific cultural norms and values; that is, helpfulness, honesty, and reciprocity. Accordingly, the third manuscript (Appendix C) deals with the case of prosocial behavior in a face-to-face interaction, assuming prosocial norms to be highly in focus. As prosocial behavior (i.e., donation) usually implies exchange inequality (because immediate reciprocal expectations are postponed), it was assumed and found that individuals high in exchange orientation act less prosocially due to their general motivation to maintain exchange equality. However, reminding them of their own death increases their motivation to act prosocially. The fourth and the fifth manuscript investigate MS effects regarding the value of honesty. In the fourth manuscript (Appendix D), we investigated and found evidence for the idea that people under MS indicate more positive evaluations for persons (e.g., Edward Snowden) who act in favor of the value of honesty and truth. The fifth manuscript (Appendix E) includes two studies revealing that MS leads people to more critical judgments toward messages of potential liars (i.e., decreased truth bias) and better detection accuracy of actual lies when primed with the value of honesty. The studies of the next three manuscripts focus on the role of the norm of reciprocity as a terror management-serving construct. The sixth manuscript (Appendix F) includes a study providing empirical support for the idea that MS increases the personal relevance of the norm of reciprocity compared to a control salience condition. The seventh manuscript (Appendix G) addresses the question of how MS affects behavioral adherence to this norm. In two studies, it is demonstrated that mortality increases motivational intentions to reciprocate a favor, and further, to act according to one's dispositional relevance of the negative norm of reciprocity following an unfavorable treatment, supporting the idea that situational conditions and dispositional norm salience are crucial factors when predicting reciprocal behavior under MS. Finally, the eighth manuscript (Appendix H) investigates the effect of MS on a persuasion

strategy that is assumed to be based on the norm of reciprocity. In two studies, it is shown that MS increases compliance toward the door-in-the-face technique.

SYNOPSIS

A Human Motivation: Terror Management

In the 1980s, Jeff Greenberg, Tom Pyszczynski, and Sheldon Solomon (1986) addressed the issue of death from a social psychological view by developing Terror Management Theory (TMT). Based on the writings of cultural anthropologist Ernest Becker, especially *The Birth and Death of Meaning* (1962), *The Denial of Death* (1973), and *Escape from Evil* (1975), they suggested an ubiquitous need for meaning and self-esteem due to efforts to secure oneself psychologically from the awareness of mortality (Greenberg et al., 1986). According to the metatheoretical framework of Becker, TMT posits that as humans developed cognitive capacities enabling them to engage in abstract thinking, they gained the ability to reflect on their own physical decay and eventual death. Concurrently, humans possess a strong drive for self-preservation. As it is universal among all living organisms, they naturally try to protect themselves from harm and danger in their ultimate striving for survival. This innate desire to live, combined with the awareness of the certainty of death, produces an omnipresent potential for paralyzing anxiety, which Becker termed "terror of death." Assuming this terror to remain in conscious awareness at all times, the pursuit of everyday life would be unfeasible.

From the perspective of TMT, people's realization of their mortality led to the development of cultural worldviews, that is, "humanly constructed shared symbolic conceptions of reality that give meaning, order, and permanence to existence, and provide a set of standards for what is valuable" (Pyszczynksi, Greenberg, Solomon, Arndt, & Schimel, 2004, p. 436; see also Kashima, 2010). In this sense, the anxiety-driven evolutionary development of culture refers to a wide range of aspects, such as art, language, religion, agriculture, and economics (for an overview see Solomon, Greenberg, Schimel, Arndt, & Pyszczynski, 2003). However, the existence of culture is only one side of the coin: to manage the terror of death effectively, it is further necessary to believe that one is meeting the

standards of value prescribed by that worldview because this promises either some form of literal (e.g., religious beliefs in an afterlife, such as heaven) or symbolic immortality (e.g., to be part of something larger and longer lasting than one's own individual life, such as families or nations). In short: The fear of death can be diminished by the cultural mechanism of self-esteem. Accordingly, self-esteem ultimately means "the feeling that one is an object of primary value in a meaningful universe" (Greenberg et al., 1992, p. 913), offering an explanation of why people need self-esteem (Pyszczynski et al., 2004). As those two interrelated psychological constructs—cultural worldviews and self-esteem—serve as an existential anxiety buffer, people are assumed to be constantly motivated to maintain faith in their culturally derived worldview. Thus, validating and maintaining the cultural shelter can be assumed to be a lifelong challenge because cultural worldviews and self-esteem are fragile constructs that continually require validation.

Two hypotheses were derived from these theoretical considerations: First, the anxiety buffer hypothesis states that high self-esteem (dispositional or manipulated) should relieve anxiety following a death-related threat. A large body of evidence is broadly consistent with this idea (for a review, see Pyszczynski et al., 2004). Greenberg et al. (1992), for instance, found that boosting self-esteem with positive feedback on a personality test led to lower levels of self-reported anxiety in response to graphic video depictions of death and to reduced physiological arousal (measured by skin conductance). Recent work of Du et al. (2013) further evidenced that in Eastern (collectivist) cultures, independent self-esteem plays a lesser role in terror management compared to interdependent self-esteem. In Western (individualist) cultures, the opposite is the case.

Second, and more important for the current work, the mortality salience (MS) hypothesis states that if cultural worldviews and self-esteem provide anxiety-buffering beliefs, then reminding people of their mortality should lead to an increased need for the protection provided by such beliefs. Although TMT conceptualizes self-esteem as a result of one's own

evaluation (to what degree one is living up to cultural norms and values), actions and beliefs of other people play a crucial role because confidence in a specific belief is strengthened when shared by others (e.g., Festinger, 1954). Consequently, people holding or acting according to contradicting beliefs become a psychological problem because this constitutes a rudimental threat to the integrity of one's own worldview, and thus weakens the protective shield against the fear of death. By the way, this makes clear that at its core, TMT is a social psychological theory.

Based on this reasoning, offering insight into a broad array of human behaviors, TMT suggests that MS increases motivation to engage in (a) worldview defending reactions and (b) striving for self-esteem (Arndt, Solomon, Kasser, & Sheldon, 2004; Maheswaran & Agrawal, 2004; Pyszczynski et al., 2004). Accordingly, in a meta-analysis, Burke, Martens, and Faucher (2010) showed that in 277 experiments, MS yielded moderate effects (r = .35) on a wide range of worldview- and self-esteem-related dependent variables.

To deepen insights on those two reactions, in the next step, empirical evidence for MS-induced worldview defense is provided. Afterwards, basic studies for MS-induced self-esteem striving are cited.

Evidence for Mortality Salience-Induced Worldview Defense

Following the assumption that MS increases the need for cultural protection, a great deal of TMT research has investigated the idea that MS should increase the motivation to defend and bolster one's own cultural worldview, resulting in derogating those who violate important cultural standards and supporting those who uphold them. In this sense, worldview defense is understood as "exaggerated evaluations of similar and different others following MS" (Solomon, Greenberg, & Pyszczynski, 2004, p. 21).

In the first empirical paper on TMT, Rosenblatt, Greenberg, Solomon, Pyszczynski, and Lyon (1989) provided evidence for the worldview defense in several studies. In the first study, for example, judges had to recommend a bond for a prostitute. MS was experimentally

manipulated by using the so-called "Mortality Attitudes Personality Survey," consisting of two open-ended short-answer questions: "Please briefly describe the emotions that the thought of your own death arouses in you" and "Jot down, as specifically as you can, what you think will happen to you as you physically die and once you are physically dead." This manipulation has been used by most TMT studies (about 80%, see Burke et al., 2010). After half of the judges received the MS induction, all judges were briefly informed about a case of illegal prostitution and were asked to set a bond for the prostitute. Results indicated that judges in the MS condition, on average, assigned a much higher bond ($455) than judges in the control condition ($50). This was in line with the author's assumption that moral principles are part of the cultural anxiety buffer and that transgressions of moral standards enhance desires of punishing the transgressor. In a further study, Rosenblatt et al. (1989) only found harsher bonds for a prostitute after MS when participants were morally opposed to prostitution, revealing that MS effects depend on individual cultural beliefs. Accordingly, TMT suggests that culturally prescribed values are integrated into a unique individualized worldview by each person, implying that attributes and behaviors that confer self-esteem can vary greatly between individuals (Solomon et al., 2004).

As group membership provides a source and validation of cultural worldviews (e.g., Fritsche et al., 2008), one basic idea of TMT contains the devaluation of groups holding different beliefs (i.e., outgroups). Thus, according to the worldview defense approach, group membership can be assumed to constitute a crucial factor in predicting reaction on MS (see Discussion for a more detailed perspective). In fact, MS was found to enhance ingroup favoritism (e.g., Harmon-Jones, Greenberg, Solomon, & Simon, 1996; Jonas, Schimel, Greenberg, & Pyszczynski, 2002) and outgroup derogation (e.g., Greenberg et al., 1990; McGregor et al., 1998). Greenberg et al. (1990), for example, asked participants with a Christian religious background to evaluate Christian and Jewish target persons after they were reminded of their own death. Results revealed more positive evaluations under MS of the

person who upholds the same cultural beliefs (the Christian) and more negative evaluations under MS of the person with contradicting beliefs (the Jew). Moreover, McGregor et al. (1998) indicated that MS-enhanced physical aggression toward those who attack one's political orientation whereby the aggressor had administered to them an increased amount of hot sauce. Regarding the ongoing conflict in the Middle East, for example, Pyszczynski et al. (2006) reasoned that reminders of death should increase the motivation of people in the United States to support violent action against Iran because both nations hold aggressive and hostile attitudes against each other (i.e., "Iran belongs to the axis of evil" vs. "United States is the enemy of Allah"). Accordingly, conservative American college students in the MS condition were found to increase support for extreme military interventions by American forces that could kill thousands of civilians. Furthermore, results of another study by Pyszczynski et al. (2006) revealed that MS increased Iranian students' evaluation of persons supporting martyrdom and having a willingness to consider causes for joining martyrdom. Thus, TMT can help explain the mechanisms of intergroup conflict and why peace work is impeded, especially in the context of war and life-threatening violence, by suggesting that aggressive and hostile behaviors toward other groups is driven by the fear of death (for a review, see Greenberg & Kosloff, 2008; Jonas & Fritsche, 2013).

After having cited empirical support on MS-induced worldview defense and the crucial role of group membership, I now turn to self-esteem striving as a second way of how to cope with the terror of mortality.

Several Ways to Strive for Self-Esteem

Self-esteem is conceptualized as the feeling of being a valuable part of a meaningful reality, which consists of socially constructed cultural standards (Greenberg et al., 1992). Thus, besides defending those standards, another way to cope with death anxiety is to gain self-esteem by living up to those standards (i.e., self-esteem striving) that promise some kind of symbolic or literal immortality. People therefore can be assumed to be constantly

motivated to enhance their self-worth through adherence to social standards and through satisfying social goals. Interestingly, from this perspective, one could speculate that the current thesis is—at least partly—based on death-related motives because earning a PhD can be assumed to be a socially valued goal.

Direct evidence of MS-increasing self-esteem striving was provided, for example, by several studies by Taubman Ben-Ari, Florian, and Mikulincer (1999), who showed that MS increased risky driving behavior (assessed through both self-reports and a driving simulator) among those participants (i.e., Israeli soldiers) who indicated their driving ability as an important source of self-esteem. Moreover, in line with the anxiety buffer hypothesis, the authors found that boosting self-esteem diminished the MS-induced need for demonstrating driving skill through risky driving. In a further study, Taubman Ben-Ari and Findler (2003) showed that this effect occurred only for men's, but not for women's, behavioral intentions to drive recklessly. Additionally, Hirschberger, Florian, Mikulincer, Goldenberg, and Pyszczynski (2002) indicated MS to lead to higher willingness to engage in a range of risky behaviors (e.g., using psychoactive substances) in men, but not in women. Beyond that, Lam, Morrison, & Smeesters (2009) assessed self-reported intentions to engage in risky sexual activities and found that men are riskier than women under MS. These findings fit research indicating risky behavior to be prototypical for men, therefore providing a source of gaining self-esteem only for them (e.g., Byrnes, Miller, & Schafer, 1999; Reinhard, Schindler, Stahlberg, 2014; Zuckerman, 1979; see also below). Another study by Hansen, Winzeler, and Topolinski (2010) showed that death-related warnings on cigarette packages led to increased positive attitudes toward smoking when smoking was a relevant source of self-esteem. Ironically, this line of research indicates that even behaviors that could be a threat to one's existence can be enhanced by reminders of death if that behavior is linked to self-esteem.

Numerous studies have further revealed that women are more likely than men to base their self-esteem on their physical appearance (e.g., Pliner, Chaiken, & Flett, 1990), and thus

are particularly likely to engage in frequent tanning (Hillhouse, Turrisi, Holwiski, & McVeigh, 1999) because having tanned skin is often perceived as normatively desired and physically attractive (e.g., Leary & Jones, 1994). Based on this reasoning, Routledge, Arndt, & Goldenberg (2004) assessed female participants' intentions to protect themselves from dangerous sun exposure by using an effective sun protection that reduces tanning effects. Results yielded that MS led them to decreased interest in sun protection in favor of tanned skin. Other research demonstrates that MS can also increase self-esteem striving in health-related fields (see Arndt, Schimel, & Goldenberg, 2003) when such fields constitute relevant contingencies of self-worth. Moreover, Greenberg, Kosloff, Solomon, Cohen, & Landau (2010) investigated motivational aspects of appeals of fame and found that people under MS showed augmented interest in having a star in the galaxy named after them. The authors interpret this finding as evidence for the idea that fame is one source of enhancing self-worth.

Another major source of self-esteem is proposed by social identity theory (Tajfel & Turner, 1979), assuming individuals to derive their self-esteem (at least partly) from positive group memberships. Humans feel good about themselves if their social group is perceived as having more positive value than the respective outgroup (Sherman, Hamilton, & Lewis, 1999). Therefore, instead of being a result of worldview defense, as shown above (e.g., Greenberg et al., 1990), ingroup favoritism and outgroup derogation may also be useful strategies to increase self-esteem (Abrams & Hogg, 1988; Branscombe & Wann, 1994; see also Baldwin & Wesley, 1996). Accordingly, MS was shown to enhance ingroup identification and ingroup bias (e.g., Arndt, Greenberg, Schimel, Pyszczynski, & Solomon, 2002; Castano, Yzerbyt, Paladino, & Sacchi, 2002; Dechesne, Janssen, & Van Knippenberg, 2000; Giannakakis & Fritsche, 2011; Fritsche, Jonas, & Fankhänel, 2008; Harmon-Jones et al., 1996; Jonas et al. 2002; Seibert, Schindler, & Reinhard, 2014; Tam, Chiu, & Lau, 2007).

More recently, my colleagues and I (2014) applied TMT and the phenomenon of ingroup bias to (negative) perceptions of overweight persons (so-called anti-fat bias). We

assumed that identification with either the group of overweight or non-overweight people to be crucial for weight-based evaluations of others, especially under MS. As ingroup favoritism is increased by MS, we suggested individuals' MS to demonstrate a weight-based ingroup bias. Therefore, evaluators associating themselves with the group "non-overweight people" should show an enhanced positive evaluation of non-overweight people as well as an enhanced negative evaluation of overweight people. This should result in a higher degree of anti-fat bias. In contrast, evaluators associating themselves with the ingroup "overweight people" were expected to more positively evaluate overweight people and to devaluate non-overweight people, resulting in a lower degree of anti-fat bias. In one study, after having received the MS or the control treatment, participants were asked to evaluate a schematic drawing of either a non-overweight or an overweight female person on several domains (e.g., attractiveness, socioeconomic status, intelligence). Finally, we assessed whether individuals associate themselves with the ingroup of overweight rather than non-overweight. Results confirmed our hypotheses by showing that the degree of anti-fat bias varied as a function of evaluators' self-perceived ingroup membership when confronted with the threat of death: While individuals who associated themselves with the group of non-overweight people demonstrated even more pronounced anti-fat bias, individuals associating themselves with the group of overweight people showed diminished anti-fat bias. In sum, this study evidences the crucial role of social identity and group membership after being reminded of one's own death (for further theoretical considerations on the role of groups, see Discussion).

Contrary to clinging to a certain group, recent work has indicated that thoughts of death can sometimes also lead to antisocial behavior. Pfattheicher and Schindler (2014) investigated the idea that MS increases the motivation to punish innocent and even cooperative individuals (i.e., antisocial punishment; Pfattheicher, Landhäußer, & Keller, in press) among those who have a disposition toward everyday sadism. This should be the case because harming and dominating others was assumed to be a way of maintaining self-esteem

(Baumeister, Bushman, & Campbell, 2000; Baumeister, Smart, & Boden, 1996; Leary, 1999). Thus, we expected individuals with a disposition toward sadistic tendencies to show increased engagement in antisocial behavior, especially when confronted with their own mortality. In one study, we first measured participants' disposition toward everyday sadism. Then, after having received the mortality or a control treatment, respectively, participants played a public game with the option of costly punishing other group members. In line with our predictions, we found that those with a strong tendency toward sadism showed increased antisocial punishment when mortality was salient, indicating that people can also use antisocial behaviors as a self-esteem enhancing strategy to cope with the threat of death.

The cited studies demonstrate that MS-induced striving for self-esteem can result in a wide range of behaviors. Although TMT suggests cultural worldviews to be integrated into a unique, individualized worldview—sometimes resulting even in self-esteem-related antisocial behavior (e.g., Pfattheicher & Schindler, 2014)—culturally shared standards (i.e., social norms and values) are assumed to shape individuals' worldviews (Becker, 1962, 1971; Berger & Luckmann, 1967; Goffman, 1959), especially through internalization processes during childhood (see also Greenberg, Solomon, & Pyszczynski, 1997). Therefore, another kind of MS-induced behavior relates to the motivation to adhere to social norms and values—in contrast to defending them. In the next section, empirical evidence on defending and fulfilling specific norms and values is reviewed.

Specific Social Norms and Values in TMT Research

Social norms and values were shown to influence human behavior systematically and powerfully (e.g., Cialdini, Kallgren, & Reno, 1991). We congratulate people on their birthdays, we give presents for Christmas, we do not shout at our supervisors, and we do not talk badly about recently deceased people. Specifically, Cialdini and Trost (1998, p. 152) defined social norms as "rules and standards that are understood by members of a group, and

that guide and/or constrain social behavior without the force of laws." Accordingly, social norms can tell us what others commonly do (i.e., descriptive norms) as well as what others commonly approve or disapprove (i.e., injunctive norms). Descriptive norms refer to information about what most people in a given situation are doing, indicating what prototypical members of a certain group are like (Goldstein & Cialdini, 2007; see also Hogg & Reid, 2006; see below for further theoretical considerations on the role of descriptive norms). In contrast, injunctive norms can be regarded as moral rules of a certain group. In a similar vein, values are conceptualized as beliefs that "pertain to desirable end states or behaviors" and "guide selection or evaluation of behavior and events" (Schwartz & Bilsky, 1990, p. 878). Thus, social values (vs. personal values) are regarded as shared by a certain group. From the perspective of TMT, social (especially injunctive) norms as well as social values constitute a fundamental part of cultural worldviews (Becker, 1962, 1971; Berger & Luckmann, 1967; Goffman, 1959), and provide an orderly symbolic reality which allows people to view themselves as meaningful as long as they live up to those norms and values (e.g., Greenberg et al., 1997). Thus, as adherence to social norms and values provides a source for self-esteem, MS is assumed to increase the motivation to act in accordance with social norms and values. On the other hand, MS is assumed to increase motivation to defend them.

In the following, evidence for MS reactions (i.e., worldview defense as well as self-esteem striving) addressing specific norms and values, as well as boundary conditions (such as group membership and norm salience), are cited. Notably, there have been several review articles on specific issues in TMT; among others are the role of self-esteem (e.g., Pyszczynski et al., 2004), positive effects of MS (Vail et al., 2012), health (Goldenberg & Arndt, 2008), cognitive processes (i.e., death thought accessibility; Hayes, Schimel, Arndt, & Faucher, 2010), peace processes (Niesta, Fritsche, & Jonas, 2008), materialism and consumer behavior (Arndt et al., 2004), and the psychological function of art (Landau, Sullivan, & Solomon, 2010), of close relationships (Mikulincer, Florian, & Hirschberger, 2003), and of religion

(e.g., Vail et al., 2010). However, no review so far has specified social norms and values that have been empirically addressed in TMT research.

Fulfilling Prosocial Norms

Most people learn from early on that living up to standards of benevolence, generosity, kindness, and unselfishness is honorable and highly desirable (e.g., Steele, 1975). Based on this, one would predict MS to increase such prosocial behavior. In line with this idea, Jonas, Schimel, Greenberg, & Pyszczynski (2002) investigated the question of whether a death prime increases prosocial attitudes (so-called "Scrooge effect"). Results showed that when participants were interviewed in front of a funeral home (MS condition), they rated charitable organizations that were important to them as more beneficial to society and more desirable to them personally than when interviewed three blocks away. Jonas et al. (2002) replicated this effect on actual donation behavior. However, MS increased the amount of contributed money only if charities supported projects in America in contrast to international projects. The authors suggested that MS results in a strong bias toward charitable causes that promote one's own culture.

Greenberg, Simon, Pyszczynski, Solomon, and Chatel (1992) further suggested that liberals rather than conservatives follow norms of tolerance. Therefore, liberals were not assumed to engage in derogatory or prejudicial worldview defense after MS. In line with this, only American conservatives were found to derogate a politically dissimilar person after MS, liberals did not, supporting the idea that social norms vary across groups, leading to different reactions after being reminded of mortality.

Research on TMT additionally indicated that MS increases endorsement of self-transcendent values, such as benevolence and universalism (assessed via Schwartz's value survey; Schwartz, 1992), and evaluations of charities, especially among participants who typically put their own well-being ahead of others ("proselfs"; Joireman & Duell, 2005, 2007). Non-experimental evidence shows that after the 9/11 terrorist attacks, which has been

indicated to be tied to death-related cognition (Landau et al., 2004; for an overview of effects of 9/11, see Pyszczynski, Solomon, & Greenberg, 2003), values of gratitude, hope, optimism, love, kindness, and teamwork were observed to be increased (Peterson & Seligman, 2003). Although one might speculate that elevating these values was, at least partially, due to efforts to manage death thoughts made accessible by the terrorist attacks, this notion contradicts the violent consequences of those attacks (e.g., Iraq war). Regarding the findings of Jonas et al. (2002) and the cited work on MS-induced ingroup favoritism and outgroup derogation (e.g., Greenberg et al., 1990; Seibert et al., 2014), it appears plausible that those prosocial values are primarily applied to people that share the same worldview.

Fulfilling Values of Materialism

In the aftermath of 9/11, President George W. Bush explicitly asked Americans to go out shopping, and indeed, from October through December, consumption soared at a 6% annual rate (Arndt et al., 2004). This example illustrates that capitalistic values of materialistic consumption—that are strongly interwoven within the American culture (e.g., Arndt et al., 2004; Shi, 1985)—can also serve as an anxiety-buffering function. A number of studies have provided empirical evidence for this idea (for a review, see Arndt et al., 2004). Mandel and Heine (1999), for example, asked participants to evaluate a series of advertisements featuring a Lexus automobile, a Rolex watch, a Geo Metro automobile, and Pringles potato chips. In line with their hypothesis that death reminders would increase the attraction of high-status objects, participants in the MS condition evaluated the Lexus and the Rolex more positively.

However, the zeal for material pursuits also implies rather egoistic and reckless behaviors. Recently, Jonas and Greenberg (2013) found MS to decrease the amount of money donated to a charity organization. They explain this effect by referring to norms of self-interest and accumulation of personal resources that are valued within the American cultural worldview. Moreover, Kasser and Sheldon (2000) showed that MS increases engagement in

greedy acquisition. In a forest-management game, the authors found participants in the MS condition to enhance wood consumption, although they were told that the forest might disappear if they continually made large bids. Additionally, they reported an increased desire for more profit than other rivals. Dechesne et al. (2003) replicated this finding for men (but not women). They further showed that this effect did not occur when providing participants with information strengthening a literal belief in consciousness after death, suggesting the indoctrination of an immortality worldview to buffer the effects of thoughts about death.

Based on those findings, and assuming capitalistic values of greedy acquisition to be predominantly existing in economic areas such as Wall Street (Falk & Szech, 2013; Liberman, Samuels, & Ross; 2004), one could speculate that the prediction of an imminent financial disaster—as far as it constitutes a kind of existential threat—motivates people in power even more to follow such capitalistic standards that might have led to the threatening situation.

Defending and Fulfilling Religious Values

A large body of evidence supports the psychological function of religion and religious beliefs when facing the threat of death (for a review, see e.g., Greenberg, Landau, Solomon, Pyszczynski, in press; Vail et al., 2010). In contrast to all other worldview elements, religion directly addresses and solves the problem of death by offering hope for literal immortality (Becker, 1973). Accordingly, Vail, Arndt, and Abdollahi (2012) found religious people (i.e., Christians, Muslims, Buddhists) to strengthen their religious beliefs after MS and simultaneously enhance denial of contradicting beliefs. By giving this ultimate, but still socially constructed and therefore fragile solution, it becomes obvious why religious beliefs imply a great potential for intergroup conflicts. As cited above, worldview defense was also shown to be based on religious group membership (e.g., Greenberg et al., 1990; Pyszczynski et al., 2006). In addition, Greenberg, Simon, Porteus, Pyszczynski, and Solomon (1995) evidenced MS to enhance inhibitions to use religious symbols in an inappropriate way: When

participants in the MS condition had to use a crucifix as a hammer (to solve a task in the most effective way), they took much longer than participants who could use a block of wood as a hammer. This finding can be explained in terms of religion-based worldview defense.

In contrast to defending one's religious beliefs, their actual contents paradoxically often rely on prosocial values such as compassion, empathy, forgiveness, and love. One might therefore conclude that especially religious fundamentalists also live up to prosocial norms after MS, given that they are imbedded in their religious worldview. In line with this reasoning, in several studies, Rothschild, Abdollahi, and Pyszczynski (2009) found people high in fundamentalism (American Christian fundamentalists, and Iranian Shiite Muslims, respectively) to be more militaristic following death reminders. However, when they were reminded of compassionate religious norms, MS decreased militaristic attitudes. Thus, in this case, following salient religious values of empathy and charity banned acts of worldview defense. Notably, priming those values only had an effect when they were portrayed in a religious context (i.e., Bible or Koran), suggesting that this kind of value adherence only serves a terror management function when those values are incorporated into one's worldview.

Explaining Contradicting Effects: The Case of Norm Salience

So far, I reviewed TMT literature supporting the idea that defending and following prosocial, materialistic, and religious norms and values can be increased when confronted with one's own death. Apparently, the respective norms and values offer conflicting prescriptions for acceptable behavior. On the one hand, MS has been shown to lead to increased generosity toward ingroup charities (Jonas et al., 2002), whereas on the other hand, MS has been shown to enhance greedy acquisition (Dechesne et al., 2003; Kasser & Sheldon, 2000). Hence, to better predict people's reactions to thinking about death, TMT research (Jonas et al., 2008) referred to the focus theory of normative conduct, a theory originally developed to address the explanatory and predictive social norms (Cialdini et al., 1991).

Assuming social norms to vary from situation to situation, Cialdini et al. (1991) proposed that a particular social norm is unlikely to direct behavior unless it is in focal attention at the time of behavior. Specifically, by referring to mechanisms of priming and spreading activation (e.g., Anderson, 1976; Collins & Loftus, 1975; Higgins & Bargh, 1987), the theory assumes norms to affect perceptions and behaviors when they are salient in attention or high in accessibility. This may be because people dispositionally follow them and/or because certain conditions of the situation itself account for their salience. A great deal of studies support the suggested norm focus as a crucial factor for the influence of social norms (Cialdini et al., 1991; Cialdini, Reno, & Kallgren, 1990; Kallgren, Reno, & Cialdini, 2000; Reno, Cialdini, & Kallgren, 1993). Kallgren et al. (2000), for example, indicated that participants littered less in a parking garage after activating an antilittering norm by a confederate who picked up a piece of trash.

Given that increased generosity after MS occurred in studies having to do with charities explicitly (Jonas et al., 2002), and that increased greed was found in studies that were directly concerned with accumulating material wealth (Kasser & Sheldon, 2000), Jonas et al. (2008) proposed MS to increase motivation to those norms that are most salient at the moment. In a series of four studies, they provided initial support for the TMT/norm focus approach. In one study, they tested whether activating proself versus prosocial norms under MS leads participants to show reactions in line with the respectively activated norm. Accordingly, results indicated that MS increased willingness to help after the prosocial prime, but decreased helping after the proself norm prime. In a further study, priming participants with conservative norms led them to recommend harsher bonds for an illegal prostitute after MS, whereas a benevolence norm prime counteracted this effect. Additional evidence for the importance of norm salience was found by Gailliot, Stillman, Schmeichel, Maner, and Plant (2008), showing that MS led to decreased prejudice toward Blacks when norms of egalitarianism were made salient. Moreover, reminding participants about helping norms in

combination with MS induction (e.g., walking by a cemetery) led them to increased helping intentions and actual helping behavior (e.g., picking up a dropped book). A study of Vail, Rampy, Arndt, Pope, and Pinel (2011) indicated that making the norm of tolerance salient eliminated the effects of MS on increased negative attitudes toward Muslims (see also Rothschild et al., 2009). Moreover, Jonas et al. (2013) recently showed that priming the norm of fairness increased generosity in the MS condition.

Based on the norm focus/TMT approach, my colleagues and I (Schindler, Reinhard, Stahlberg, & Len, in press) also addressed the role of situational norms assuming prosocial behavior (e.g., donation) usually to imply exchange inequality because immediate reciprocal expectations are postponed. Therefore, we suggested that individuals high in exchange orientation would act less prosocially due to their general motivation to maintain exchange equality (Buunk, Doosje, Jans, & Hopstaken, 1993; Buunk & Schaufeli, 1999; Murstein, 1977). However, in a situation where prosocial norms are highly salient, reminding them of their own death should increase their motivation to act prosocially. To test this idea, we first assessed participants dispositional exchange orientation. Then, after having completed some filler tasks, they received a typical MS or the control treatment. After a standard delay task, participants were told to enter the room next door to receive their participation payment. There, they received a five Euro bill by a confederate and were asked if they would like to donate the payment to a charity organization the confederate was privately supporting. In line with our prediction, results yielded that with increasing dispositional exchange orientation, the probability of donating the participation payment decreased. However, when mortality was salient, exchange orientation was not a relevant factor any more: Both types of participants (i.e., those who were low as well as those who were high in exchange orientation) were equally likely to donate their participation payment after MS. Furthermore, according to the idea that MS increases motivation to fulfil situationally prescribed norms, participants high in exchange orientation were more likely to donate after MS compared to the dental pain control

condition. Referring to the salience of prosocial norms, we assumed the direct face-to-face interaction to be a crucial factor for our findings because it might have increased salience by inducing normative pressure and social desirability to follow the prosocial request (for more detailed consideration of the role of anonymity, see Discussion).

Defending and Fulfilling the Value of Honesty

Honesty matters: A representative survey (Geißler, Schöpe, Klewes, Rauh, & von Alemann, 2013) indicated that when Germans were asked to spontaneously name their most important personal value, most of them named honesty—ahead of fidelity, reliability, or helpfulness. Moreover, honesty was shown to be an important value in romantic relationships (Weber & Ruch, 2012) and politics (Bishin, Stevens, & Wilson, 2006). Generally, because TMT suggests social norms and values to be crucial when coping with the threat of death, it can be assumed that the value of honesty becomes more relevant for one's behavior after MS. Specifically, from a worldview defense perspective, this leads to the notion that MS increases the motivation to defend this value and to support people who act in line with it. Schindler, Pfattheicher, and Reinhard (2014) investigated this idea in reference to former National Security Agency contractor Edward Snowden. Snowden has become famous worldwide for disclosing top-secret NSA documents, among other things, which contained information about global surveillance activities run by the NSA. Snowden himself said that he aimed "to inform the public as to that which is done in their name and that which is done against them" (Greenwald, MacAskill, & Poitras, 2013). Regarding his personal sacrifices (such as living in exile apart from his family, being accused of breaking the law, giving up his career), it seems plausible to assume that Snowden's disclosures where motivated by fighting for the truth and for the value of honesty. Based on this, Schindler et al. (2014) proposed and empirically evidenced MS to enhance heroic perceptions of Snowden. Moreover, in line with the assumption that honesty and fighting for the truth constitute cultural values independent of patriotism and political orientation, no interaction of those factors with MS occurred.

Regarding the role of norm salience, however, one might consider other cultural values to be important for the perception of Snowden, such as loyalty toward the employer. One could further speculate that pronouncing increased insecurity through Snowden's disclosures might lead to devaluation of him and his actions, especially after existential threat.

Another line of TMT studies that deals with the value of honesty refers to veracity judgments of potential liars (Schindler & Reinhard, 2014a). Besides the well-documented poor ability to discriminate accurately between lies and truths (slightly above chance level; Bond & DePaulo, 2006), literature asserts a general tendency to judge messages as true (so-called *truth bias*). A meta-analysis of the percentage truth classifications revealed a mean of about 57%, which differed significantly from 50%, supporting the truth bias (Bond & DePaulo, 2006, see also Vrij, 2000). Literature attributes the truth bias to the phenomenon whereby in daily communications, people usually believe messages from other people without questioning honesty (e.g., Levine et al., 2010). However, truth bias has been shown to decrease when there are contextual cues for suspicion (McCornack & Levine, 1990), that is, when beliefs about communicative honesty are questioned. Given that findings on TMT suggest that MS increases people's need for salient cultural norms and values to be fulfilled, Schindler and Reinhard (2014a) assumed that by priming people with the value of honesty, MS would increase state suspicion and, consequently, criticism toward other people's messages (i.e., reduced truth bias). To test this hypothesis, in two studies, we manipulated MS and value salience before participants watched and judged several different sets of videos containing actual true or false messages. In the first study, we used a no-prime control condition, whereas in the second study, a group solidarity value-prime condition was included, assuming to lead to ingroup favoritism and less suspicion after MS (i.e., increasing truth-bias). Results of both studies yielded support for the hypotheses: When the value of honesty was salient, MS led to a reduced truth bias (Study 1 & 2), whereas priming the value of group solidarity led to an increased truth bias after MS (Study 2). These findings are

especially relevant in the context of persuasion, as suspicion toward the sender is likely to decrease persuasiveness. Looking at political actors, for example, avoiding every reason for suspicion seems to be crucial for achieving their aims. Thus, after existential threats, such as the events of 9/11, it seems more beneficial for political leaders to pronounce values of solidarity, whereas pronouncing the value of honesty (e.g., by the media) instead might decrease their persuasiveness.

Those first three studies provide support for the idea that MS increases the importance of honesty; however, several open questions remain: Although one could argue that persons who behave dishonestly receive less support after MS, literature distinguishes self-centered and other-oriented lies (e.g., Kashy & DePaulo, 1996). While the first ones refer to the liars benefit, the latte ones concern the benefit of other people. Thus, although lying is, in general, perceived as a moral transgression, it remains an open question whether both types of lies are equally disapproved under MS. Another issue relates to veracity judgments of outgroup members. Given that MS leads to worldview defending reactions, it seems plausible that statements of outgroup members are judged more critically, probably leading to a lie bias. Besides a worldview defense perspective (i.e., evaluating others regarding honesty), people under MS can also be assumed to gain self-esteem through fulfilling the value of honesty themselves. Thus, people under MS should, for example, report cheating less in romantic relationships or should show less deceptive behavior in job interviews. For such predictions, however, it seems necessary that the value of honesty is cognitively focused. Otherwise, as MS was discussed earlier to enhance greedy acquisition, for example, one might speculate that MS also can increase deceptive behavior. In sum, those open questions point to a fruitful area for future research.

Tit for Tat: Fulfilling the Norm of Reciprocity

A widespread internalized moral principle for social exchange and for social life in general is the norm of reciprocity (e.g., Cialdini & Goldstein, 2004). Compared to previously

investigated social norms in terror management theory literature (e.g., egalitarianism, tolerance, conservatism), the principle of reciprocity has been discussed as being fundamental for the evolutionary development of human altruism and cooperation (Field, 2004). The norm prescribes that people should support, and not injure, those who previously supported them (Gouldner, 1960). A great deal of research supports the idea that receiving a favor elicits a feeling of obligation to reciprocate this favor by complying with a following request (e.g., Cialdini, Green, & Rusch, 1992; Edlund, Sagarin, & Johnson, 2007; Regan, 1971; Whatley, Webster, Smith, & Rhodes, 1999).

Assuming the norm of reciprocity to be an important aspect of individuals' worldview, my colleagues and I (Schindler, Reinhard, Stahlberg, 2012, 2013) stressed the idea that MS increases the motivation to follow this norm. In a first study (Schindler et al., 2012), we hypothesized that MS increases the relevance of the norm of reciprocity. Therefore, after MS induction and a short delay, the personal relevance of the norm of reciprocity was measured as the dependent variable using the *Personal Norm of Reciprocity* questionnaire (Perugini, Gallucci, Presaghi, & Ercolani, 2003). In line with our prediction, we found MS to increase the overall reported relevance of the norm.

In a next step, we focused on participants' behavioral intentions of returning a favor under MS (Schindler et al., 2013, Study 1). As research has indicated that a favor of a server increases tip percentages (Rind & Strohmetz, 1999), after MS induction and a short delay, we used a fictitious scenario in which participants read that while going out for food in a restaurant, they received a favor from a server; namely, an espresso on the house. In the control condition, the server did not provide an espresso, and thus this situation did not call for reciprocating a favor. Afterwards, we assessed the dependent variable by asking about the amount of tip participants would give. According to our idea that MS increases the motivation to follow the norm of reciprocity and further reciprocating a favor, people should give a higher tip under MS after having received a favor. Moreover, this is exactly what we found:

When the norm of reciprocity was activated in participants through the favor, MS led to higher tipping. This is compared to participants who were not reminded of their own death. Notably, there was no main effect of MS, indicating that participants did not give a higher tip just because of MS, but only when the norm of reciprocity was activated.

Besides the positive form of reciprocity (returning a favor), the literature also mentions a negative dimension called the principle of retaliation. It prescribes that people should retaliate against those who have been detrimental to their own interests (e.g., Eisenberger, Lynch, Aselage, & Rohdieck, 2004; Gouldner, 1960; Perugini, Gallucci, Presaghi, & Ercolani, 2003). In a further study (Schindler et al., 2013, Study 2), we assumed that in cases of unfavorable treatment, participants under MS should increase motivation to retaliate, especially when they strongly believe in the norm of retaliation (i.e., high dispositional salience). To test this idea, after MS induction and a short delay, participants read a scenario in which they had to play a fictitious dictator game with a person who previously had refused to help them (see also Perugini et al., 2003). Additionally, we assessed participants' relevance of the negative norm of reciprocity (Perugini et al., 2003). As predicted, participants who strongly believed in the norm of retaliation gave a lower amount of money to the favor denier under MS (i.e., thinking about death led them to harsher punishment).

According to TMT, it further can be assumed that MS also increases motivation to comply with a persuasion strategy when it is grounded in an important social norm, such as the norm of reciprocity. Thus, my colleague and I (Schindler & Reinhard, 2014b) investigated the idea that MS should lead to enhanced effectiveness of the door-in-the-face (DITF) technique—a persuasion strategy that was shown to be based on the norm of reciprocity (Cialdini et al., 1975). The effectiveness of this strategy is evidenced by several meta-analyses (Dillard, 1991; Dillard, Hunter, & Burgoon, 1984; Feeley, Anker, & Aloe, 2012; Fern, Monroe, & Avilla, 1986; O'Keefe & Hale, 1998) and is built on the following principle: To

increase compliance with a request for a favor, the DITF technique comprises two requests that are issued subsequently. The initial request is chosen to be so large that it is expected to be refused by the respondent. The second request, which follows upon rejection of the large one, is much smaller and constitutes the critical favor for which compliance is actually hoped to be increased. The moderation of the previous large request should be perceived as a concession (i.e., a favor), consequently activating the norm of reciprocity. Due to the motivation to reciprocate this concession, compliance rates for a critical request issued by means of the DITF technique are therefore expected to be higher as compared to compliance rates achieved through making the critical request only.

In two studies, we investigated the question of whether MS increases effectiveness of the DITF technique. In the first study (Schindler & Reinhard, 2014b, Study 1), we used a typical MS manipulation and a hypothetical scenario to assess participants' behavioral intentions of buying a newspaper. In the DITF condition, they were asked by a person to subscribe to a newspaper for two years. Having refused the subscription, they were asked by the person to buy today's newspaper edition. This smaller request should be perceived as a concession that should activate the norm of reciprocity. In the critical-request-only condition, participants were confronted with the question about today's newspaper edition. In line with our predictions, results revealed that using the DITF technique increased the likelihood of buying the newspaper after MS compared to the dental pain control condition. To replicate those findings on actual behavior, we conducted a field study (Schindler & Reinhard, 2014b, Study 2) in which we induced MS by handing out death flyers to individuals' walking on the campus. The MS flyer contained the bold words "Death-Thoughts?!" whereas the control flyer contained the words "TV-Consumption?!". About fifteen meters away, participants in the DITF condition were first asked if they would be willing to participate for one year in a mentoring program where grown-ups take responsibility for a disadvantaged child. If participants refused to participate in the program, they were told that they also can support the

charity organization financially and were asked for a donation. Analogous to the hypothetical scenario, we found MS to increase the amount of donated money when using the DITF technique compared to the control flyer condition. In sum, those findings support the idea that MS increases the effectiveness of persuasion strategies that are based on social norms, such as the norm of reciprocity. Besides the DITF technique, this could also hold, for example, for the low-ball technique because it is assumed to be based on the norm of commitment (e.g., Burger & Cornelius, 2003; Cialdini, Cacioppo, Bassett, & Miller, 1978; Guéguen, Pascual, & Dagot, 2002).

In sum, those studies strongly support the norm of reciprocity to guide human behavior, especially under threat. Nevertheless, future research should address additional boundary conditions. Given, for example, that MS increases ingroup identification and ingroup bias (Harmon-Jones et al., 1996; Jonas et al., 2002), it seems crucial whether the benefactor of reciprocating a favor belongs to the in- or outgroup. It seems straightforward that reciprocation is more important regarding the ingroup. However, regarding the role of sympathy, one might speculate that in some situations, people immediately return a favor more likely from a dislikeable rather than from a likeable, unknown person, because the feeling of being indebted to a dislikeable person might be more aversive. Instead, when an unknown person is likeable, it heightens the probability—or at least decreases the aversion—of seeing each other again, reducing the pressure of returning the favor immediately.

Fulfilling Pro-environmental Norms

Regarding the issue of eco-friendly conduct in everyday life, Fritsche, Jonas, Niesta Kayser, and Koranyi (2010) suggested thinking about one's own death as a possible promoting factor. They argued that in most industrialized countries, prescriptive norms of pro-environmental behavior have become important and culturally shared. Therefore, according to the norm focus/TMT approach, they hypothesized that MS increases pro-environmental behavior when pro-environmental norms are focused. In a series of studies,

Fritsche et al. (2010) provided evidence that following salient pro-environmental norms can serve a terror management function. In one study, for example, they activated the pro-environmental norm via a 90-second advertisement about coffee in which a person appreciated reusable cups compared to "such polluting stuff" (p. 75). Results indicated that having seen this advertisement combined with MS led to an increase of actual consumption of reusable cups instead of disposable ones. Similarly, based on one study, Vess and Arndt (2008) came to the conclusion that MS increases environmental concern when environmental action is a personally valued norm, that is, when engaging in eco-friendly conduct determines people's self-esteem. Moreover, Fritsche and Häfner (2011) investigated boundary conditions of MS-induced pro-environmental behavior. They suggested and found evidence for the idea that when pro-environmental behavior is illustrated to protect nature for its intrinsic values (biocentric motivation), in contrast to saving the future of humankind (anthropocentric motivation), MS decreases pro-environmental action. The authors regard this result in line with findings of Koole and Van den Berg (2005), showing that MS leads to derogation of (mortal) nature as a way to disconnect humans from mortality (see also Goldenberg, 2005). Ironically, this work leads to the notion that existential threats induced by nature itself (such as floods droughts, extreme weather) reduces concerns for nature—at least for its intrinsic values—which further might increase the frequency of such threats.

Fulfilling Descriptive Norms

Up to now, the cited research on social norms concerned rather injunctive norms, referring to what most people approve and disapprove and what ought to be done, constituting the moral rules of a certain group (Cialdini et al., 1991). By contrast, descriptive norms refer to information about what most people in a given situation are doing, indicating what prototypical members of a certain group are like. Given that Pyszczynski et al. (2004) defined worldviews as "humanly constructed shared symbolic conceptions of reality that give meaning, order, and permanence to existence, and provide a set of standards for what is

valuable," it seems difficult to determine to what extent MS might influence behavior based on descriptive norms, as they do not directly contain "a set of standards of what is valued." Descriptive norms, by definition, show how to adapt to a certain group. Indeed, as mentioned earlier, according to social identity theory (Tajfel, 1982; Turner, 1987), group membership provides a highly relevant source of self-esteem. Especially, being a prototypical member of one's ingroup is related to an increase in self-worth (e.g., Reinhard et al. 2014; Reinhard, Stahlberg, & Messner, 2009). Therefore, MS can be expected to increase the motivation to act according to descriptive norms as a way to gain self-esteem through being a prototypical member of one's ingroup. In line with this idea, Renkema, Stapel, & van Yperen (2008) found evidence that people under MS are more likely to adapt the opinions of others (e.g., judgments of abstract drawings). Moreover, Jonas & Fritsche (2012) manipulated a descriptive norm for optimism by informing German people about the chances their fellow Germans were giving the German national team in the World Cup. Results yielded that MS led participants provided more optimistic predictions for the German team when the ingroup norm was rather optimistic compared to pessimistic, supporting the idea that compliance with a descriptive norm enables affirming ingroup membership, which further buffers against the fear of death. Notably, according to Cialdini et al. (1991), descriptive norms are especially likely to guide behavior when information about injunctive norms is not available.

Discussion

The present work aimed to give an overview on TMT research by primarily focussing on the role of specific social norms and values. TMT provides a theoretical framework of how people cope with the threat of death by assuming self-esteem (i.e., feeling of being a valued object in a meaningful universe) to have a crucial anxiety-buffering function. Furthermore, the theory states that cultural worldviews constitute a major source of self-esteem. Therefore, on the one hand, confronting people with their own mortality is assumed to enhance

motivation to engage in derogating those who violate important cultural standards and supporting those who uphold them (i.e., worldview defense). On the other hand, MS is assumed to increase self-esteem striving according to standards of one's own individual worldview. As cultural standards strongly form individual worldviews, social norms and values should therefore become more relevant for one's behavior following death reminders.

After having provided basic evidence for worldview defending (Rosenblatt et al., 1989; Seibert et al., 2014) as well as for self-esteem striving reactions (e.g., Pfattheicher & Schindler, 2014; Taubman Ben-Ari et al, 1999), I reviewed TMT literature concerning specific social norms and values, as well as boundary conditions. In sum, MS effects were shown on prosocial norms (e.g., Jonas et al., 2002, 2008; Schindler et al., in press), materialistic values (e.g., Kasser & Sheldon, 2000; Mandel & Heine, 1999), religious values (e.g., Greenberg et al., 1995; Pyszczynski et al., 2006), the value of honesty (Schindler et al., 2014, Schindler & Reinhard, 2014), the norm of reciprocity (e.g., Schindler et al., 2012, 2013, 2014), pro-environmental norms (e.g., Fritsche et al., 2010), and finally descriptive norms (e.g., Jonas & Fritsche, 2012). In line with the focus theory of normative conduct (Cialdini et al., 1991), it was additionally shown that social norms and values guide MS reactions especially when they are cognitively focused (i.e., situational or dispositional salience; e.g., Gailliot et al., 2008; Jonas et al., 2008; Schindler et al., 2013). A further boundary condition of MS effects refers to the role of group membership. Jonas et al. (2002), for example, showed that MS increases prosocial behavior only when it benefits people who share the same worldview. This is in line with the notion that MS increases ingroup favoritism and outgroup derogation (e.g., Greenberg et al., 1990; Harmon-Jones et al., 1996).

Although the current work provides an overview on how specific norms and values relate to TMT, assuming them to be fundamental parts of individuals' worldviews, it would lend to a deeper understanding of TMT mechanisms to further elaborate on the concept of worldviews. Defining them as a "set of standards for what is valuable" (Pyszczynksi et al.,

2004, p. 436) leaves much room for post-hoc interpretations (for discussion of culture in TMT, see Kashima, 2010). Thus, accuracy of terror management predictions would be increased by a more precise conceptualization. Beyond this issue, I now turn to some critical points and open questions regarding TMT research.

Toward the Role of Groups and the Function of Self-Esteem

As cited above, groups play an important role when coping with the threat of death. First, group membership provides a source and validation of cultural worldviews, leading to the devaluation of outgroups and upvaluation of the ingroup (e.g., Greenberg et al., 1990). Second, (especially positively valued) groups offer a source of self-esteem by providing social identities (e.g., Tajfel & Turner, 1979), leading to increased ingroup identification, resulting, as well, in ingroup bias (e.g., Harmon-Jones et al., 1996; Giannakakis & Fritsche, 2011). A third perspective proposes group membership as an anxiety buffer per se (Castano et al., 2002; Castano & Dechesne, 2005). Castano and Dechesne (2005), for example, reasoned that social identity based on group membership might provide a symbolic afterlife because social groups live on after the individuals' death. Thus, group membership provides a possibility for individuals to distance themselves from the parts of their personal identity that are going to die and to identify with an entity (i.e. the social group) that is longer lasting than the personal self. In this perspective, upgrading ingroup membership by ingroup favoritism and outgroup derogation functions to increase the capacity of one's own social ingroup, to ensure an afterlife. Castano, Yzerbyt, Paladino, and Sacchi, (2002) provided evidence for this idea by showing that MS did not only increase ingroup identification, but additionally showed perceptions of ingroup entitativity, meaning the degree to which a group is perceived as having a real existence (see also Campbell, 1958). Moreover, Giannakakis and Fritsche (2011; see also Fritsche et al., 2008) also assumed groups to be of intrinsic value for buffering existential threat by claiming that "many of the observed consequences of existential threat

might be of an essentially collective nature" (Giannakakis & Fritsche, 2011, p. 91). At the same time, they emphasize not neglecting individual strategies to cope with MS.

Another line of research further supports the idea for a group-based anxiety buffer. Traditionally, TMT conceptualized self-esteem as "the feeling that one is an object of primary value in a meaningful universe" (Greenberg et al., 1992, p. 913), offering an explanation of why people need self-esteem (Pyszczynski et al., 2004). Based on the assumption that humans have an evolutionarily fundamental need to belong, sociometer theory conceptualizes self-esteem as an inner gauge, monitoring social acceptance in order to avoid life-threatening social isolation (Leary & Baumeister, 2000; Leary, Tambor, Terdal, & Downs, 1995; see also Szücs, Schindler, Reinhard, & Stahlberg, 2014). Following this theory, state self-esteem is presumed to be the warning component of the sociometer, and drops after cues of relational devaluation. In other words, self-esteem is not an end in itself, but a guideline to social acceptance. In line with this assumption, numerous studies have shown a decline of state self-esteem after negative social feedback (e.g., Denissen, Penke, Schmitt, & van Aken, 2008; Leary et al., 1995; Leary, Haupt, Strausser, & Chokel, 1998; Srivastava & Beer, 2005). Regarding relationships with others, TMT suggests them to be primarily valued because they constitute a way to gain self-esteem through validating one's worldviews. However, according to sociometer theory, one would argue that the fear of death is ultimately not reduced by gaining self-esteem, but by the feeling of belonging, or as Leary (2004) put it: "Proponents of sociometer theory simply need to assume that, among its other effects, mortality salience creates a threat to people's social connections because death is the ultimate social exclusion" (p. 479). So, many of the terror management findings can be reinterpreted in terms of seeking social acceptance instead of worldview-based self-esteem striving. Indeed, empirical evidence on TMT suggests MS to increase desires for social acceptance and interpersonal affiliation (Arndt et al., 2002; Dechesne, Greenberg, Arndt, & Schimel, 2000; Mikulincer et al., 2003; Hirschberger, Florian, & Mikulincer, 2003; Taubman Ben-Ari,

Findler, & Mikulincer, 2002; Wisman & Koole, 2003). Since the feeling of social acceptance largely depends on meeting prescribed norms (Baumeister, 2005; Ostrom, 2000), it follows that confronting people with their own death should increase their motivation to adhere to social norms. Especially, MS-induced adherence to descriptive norms (Jonas & Fritsche, 2012; Renkema et al., 2008) fits this notion. Despite the doubts that self-esteem functions as a buffer against death anxiety, Leary (2004) admitted that "TMT offers an elegant, broad perspective on the effects of mortality salience" (p. 482). According to Pyszczynski and Kesebir (2012), the debate about alternative explanations for death effects finally comes down to a "chicken or egg" sort of question: Do people strive for social acceptance because it reduces death anxiety, or is death threatening because it compromises social connections? They state that TMT was not developed to explain why MS produces diverse effects, but rather to explain why people need self-esteem and faith in their worldviews.

That said, an exciting point that follows from the idea that striving for social acceptance is the ultimate strategy to buffer death anxiety—rather than gaining self-esteem through validating one's worldview—is that group affiliation should occur after MS, even though the group holds worldview-threatening beliefs. This is exactly what Wisman and Koole (2003) found: When people were reminded of their own death, it became important for them to sit close to other group members even if those group members held worldviews which were different from their own. The authors concluded that sometimes, affiliation defenses seem powerful enough to override worldview validation defenses. In my view, the studies include two critical points: First, in all three studies, the same paradigm of group affiliation (choosing a chair during a discussion) was used, leaving some doubt as to whether those findings hold across other settings. Second, participants were not given any information on which specific topic the group members held different worldviews. If those group members were, for example, described as racists, most people would probably have shown worldview-defending reactions after MS rather than group affiliation because racist attitudes presumably

strongly contradict most people's worldview. Nevertheless, Wisman and Koole provided first evidence for the interesting idea that social acceptance might be—at least sometimes—more important than the validation of one's worldview after a death threat.

Evidence that seems to directly contradict the findings of Wisman and Koole (2003) is reported by Arndt et al. (2002), showing that MS increases identification with one's ingroup only to the extent that the ingroup is perceived positively. That is, when group membership implies negative effects for self-esteem, MS is likely to lead to group distancing in terms of group disidentification. Given this evidence, Arndt and colleagues finally stated that "associations with others are an important means of maintaining psychological equanimity; however, this is true only when that sense of belonging helps to validate one's worldview or one's self-esteem." (p. 39–40). Given, however, that striving for social acceptance is not equal to group identification (as one could follow group norms without identifying with the group), future research should rely on more specific conceptualizations to address this issue in a fruitful way.

Moderating MS Effects: The Case of Anonymity

Besides the debate of what matters most (social acceptance vs. worldview-based self-esteem), another question is: What matters when? Looking at TMT research reveals that most MS-induced worldview defending, aggressive, and proself reactions have been found in anonymous settings. Jonas et al. (2008, Study 1) found a proself prime to decrease anonymously reported willingness to help after MS. Moreover, Jonas and Greenberg (2013, Study 1) found MS to decrease the amount of donated money toward an outgroup-focused charity. In this study, participants were told to put their donation amount in an envelope and to drop the envelope in a box. Schindler et al. (2013) found MS to lead to increased retaliation intentions in a hypothetical scenario. Pfattheicher and Schindler (2014) showed MS to lead sadists' to show increased punishment of cooperative others; also, MS was found to increase aggression against worldview-threatening others using the hot sauce paradigm (McGregor et

al., 1998). However, decisions in the social dilemma and in the hot sauce paradigm were made without knowing, or even meeting, the ostensibly punished persons. The same applies to the studies of Arndt et al. (2002), where MS led participants to disidentify with their ingroup when it was linked to negative aspects. In contrast, the studies of Wisman and Koole (2003) contained a paradigm where participants were instructed that they would actually have a discussion with other people. Thus, their decision about the seating position during the discussion can be assumed to have been based on a public scenario, that is, participants knew they would actually meet the people who disagree with their worldview. Additionally, Schindler et al. (in press) showed that participants under MS did not act in line with their dispositional exchange orientation (i.e., individual worldview), but with the prosocial norm of donating. This finding occurred when participants were asked for donations in a face-to-face interaction (i.e., in a public setting).

Taken together, it seems to be crucial whether MS reactions are assessed publicly or anonymously. In line with this reasoning, research on cooperation in social dilemmas (e.g., Axelrod, 1984; Fox & Guyer, 1978) has suggested that cooperation decreases when decisions are made anonymously. Beyond just increasing norm salience, it seems plausible to assume that a direct face-to-face interaction additionally induces normative pressure and social desirability, which finally leads to behavior that—especially under MS—complies with expectations of what is socially expected. In our study (i.e., face-to-face interaction; Schindler et al. in press), MS therefore led to an increase in prosocial behavior despite conflicting interests (i.e., exchange orientation). Thus, one could argue that defensive and aggressive behavior is more likely to occur in anonymous situations, as prosocial norms and values can be violated without social sanctions. Nevertheless, it also seems conceivable that in some situations, groups demand rather defensive or aggressive behavior. Strong patriotism, for example, can involve expectations of fighting and making sacrifices for one's country (Pyszczynski et al., 2003, see also Mummendey, Klink, & Brown, 2001), implying a high

potential for conflict when one's own country is (verbally or militarily) attacked. As mentioned earlier, reminders of death increased the motivation of conservative people in the United States to support violent action against Iran (Pyszczynski et al., 2006). Furthermore, fundamental religious beliefs can imply norms of vigorously defending the truth about humanity and deity against forces of evil (Altemeyer & Hunsberger, 1992). Accordingly, results of another study by Pyszczynski et al. (2006) revealed that MS increased Iranian students' evaluation of persons supporting martyrdom and having a willingness to consider causes for joining martyrdom. Although those findings are clearly in line with the worldview-defense hypothesis, one could also speculate that such aggressive tendencies result from fundamental religious or patriotic beliefs because they imply expectations of (violent) defensiveness. Regarding the role of anonymity, such behavior can be expected in an anonymous situation, but also in a public situation, given that this behavior is momentarily accepted or even expected by present others. However, the question remains whether worldview defense still occurs in a public setting when it is not accepted, leading again to the debate of what matters most. Therefore, I suggest the role of anonymity to constitute an important and promising, but so far disregarded, issue in TMT research.

Alternative Explanations of Mortality Salience Effects

Conceptually, TMT assumes death to be of unique psychological importance (Greenberg, Solomon, Arndt, 2008), as it is "the only certain future we will face" (p. 121). Although Burke et al. (2010) found strong evidence for the MS hypothesis in their meta-analysis (across a wide range of control manipulations, such as meaninglessness, dental pain, general pain, social exclusion, uncertainty), there is an ongoing debate about the uniqueness of the threat caused by MS-related thoughts or symbols (Fiedler, Kutzner, & Krueger, 2012; Jonas et al., 2014). Research has shown, for example, that MS effects rely on a group-based control restoration motivation (Agroskin & Jonas, 2013; Fritsche et al., 2008, see also Fritsche, Jonas, & Kessler, 2011) and that death thoughts produce effects similar to meaning

and certainty threats (e.g., McGregor, 2006; Proulx & Heine, 2006; van den Bos, Poortvliet, Maas, Miedema, & van den Ham, 2005). According to this issue, Martens, Burke, Schimel, and Faucher (2011) recently reported meta-analytic-based evidence that both MS and meaning/certainty threats increased defensiveness after a short delay. Nevertheless, with a longer delay, MS produced even higher levels of defensiveness, whereas meaning/certainty threats produced lower levels of defensiveness, confirming the assumption that death is a qualitatively unique threat. Additionally, Echebarria-Echabe (2013) recently provided evidence that similar effects of MS and uncertainty seem to be the result of different processes.

In a recently published article, Jonas et al. (in press) focused on commonalities of different threat approaches and provided an integrative general model of threat and defense processes. They report some empirical evidence for the assumption that all threats (e.g., mortality, uncertainty, uncontrollability) present people with the experience of a discrepancy that immediately activates basic neural processes related to anxiety, leading to avoidance motivation on a proximal level (i.e., immediately after MS manipulation), and approach motivation on a distal level (i.e., after delay; see also Arndt, Greenberg, Solomon, Pyszczynski, & Simon, 1997). At the same time, Jonas et al. (in press) pronounce that this framework does not rule out differences between the various approaches. In line with this reasoning, one plausibly can assume that there are some common mechanisms between MS and other threats. However, regarding the huge amount of studies on MS and TMT, it is arguable that any of those threats can account for all of the effects found so far that are produced by confronting people with their own death.

Is There a Way of Peaceful Living?

Literature on TMT evidences a positive side (e.g., increasing prosocial actions) but also a dark side (e.g., increasing aggressive forms of worldview defense; for a review, see Vail et al., 2012) of death. Thus, coping with death is neither inherently good nor bad;

reactions basically depend on the (internalized and activated) content of one's worldview (for a recent review on violent intergroup conflicts, see Jonas & Fritsche, 2013). Accordingly, most peaceful worldviews are presumably those which offer meaning and self-worth without implying costs for others. Solomon et al. (2004) suggested the "best" worldviews are those based on tolerance toward different others and on flexibility and openness to modification. In contrast, rigid, fundamental, and dogmatic worldviews can be assumed to embody a high potential for conflicts. At first glance, the first type of worldview seems to be a solution that easily can be attained. Greenberg et al. (in press), however, described such relativistic worldviews as a hard place where one lives in uncertainty about what is right or wrong. According to their opinion, such peace-promoting worldviews require basic material certainty and are therefore unlikely to occur in areas of great poverty.

Besides looking at how people respond (peacefully) to death thoughts, one could also ask whether there is a way of not responding; in other words, is there a way of facing mortality without anxiety? First of all, when speaking of managing the terror of death, one might wonder whether there is any terror at all. Actually, there is strong evidence that thinking about death does not relate to perceived anxiety or other affections (Burke et al., 2010). This is not surprising, given that TMT is about the question of how people handle the knowledge of dying some day without perceiving fear (Solomon et al., 2004). Although discussing the psychodynamic processes underlying MS effects is beyond the scope of this work, I would like to propose the idea that how we think about death might play a more important role in resulting reactions than has so far been assumed (see also Bargh, 2004). TMT basically assumes that unconscious cognitive processes drive MS-induced worldview defense and self-esteem striving (see e.g., Arndt, Greenberg, & Cook, 2002; Hayes, Schimel, Arndt, & Faucher, 2010). However, some research addresses the issue of direct encounters with death instead of rather subtle and unanticipated (rather unconscious) death reminders, such as the typical MS manipulation. On the one hand, traumatic life-threatening experiences

(e.g., accident, natural disaster) are suggested to enhance the risk of developing debilitating anxiety disorders (Hathaway, Boals, & Banks, 2010), which can be, at least partly, linked to a collapse of an individuals' terror management system (e.g., Abdollahi, Pyszczynski, Maxfield, & Luszczynska, 2011). On the other hand, research on near-death experiences and post-traumatic growth suggests that damaging the typical system of anxiety buffers offers the possibility of experiencing positive psychological and existential development (e.g., intrinsically, meaningful goal shifts; Tedeschi & Calhoun, 2004; Cozzolino, 2006; Vail et al., 2012, see also Yalom, 1980). In line with this reasoning, the work of Cozzolino and colleagues provided evidence for the idea that deeply contemplating death (so-called death reflection) leads (especially extrinsic) participants to intrinsic, unselfish behavior (compared to increased greed after a typical MS induction; Cozzolino, Staples, Meyers, Samboceti, 2004; see also Cozzolino, Sheldon, Schachtman, & 2009).

TMT has also been linked to several dispositional concepts. It was shown that a low personal need for structure (e.g., Juhl & Routledge, 2010; Vess, Routledge, Landau, & Arndt, 2009), high self-control ability (Gailliot, Schmeichel, & Baumeister, 2006), secure attachment style (Mikulincer & Florian, 2000), low neuroticism (Arndt & Solomon, 2003), and high mindfulness (Niemiec et al., 2010) serve an anxiety-buffering function. Regarding the idea that how one thinks about death matters, the concept of mindfulness appears to be especially promising. It is characterized by non-evaluative, receptive attention to present experience (Brown, Ryan, & Creswell, 2007), meaning that one is just witnessing one's own thoughts and emotions rather than identifying and acting on them. Consequently, recognizing death as a pure thought might decrease its potential threat of psychological equanimity. Besides providing evidence for the anxiety-buffering function of high trait mindfulness, in one study, Niemiec et al. (2010, Study 6) found that more mindful participants spent a longer time on writing during the MS manipulation, which further led to reduced defensive reactions. Although more evidence is clearly needed, these findings tentatively point to the idea that

deep contemplation and receptive consideration of death can reduce its defensive responses and therefore might provide a way to a more peaceful world.

Conclusion

The current work aimed to review TMT literature relating to specific cultural values and social norms. It was shown that death reminders affect reactions in the context of prosocial norms, values of materialism, religious values, the value of honesty, the norm of reciprocity, pro-environmental norms, and descriptive norms. Additionally, boundary conditions (such as group membership and norm salience) were explicated. Despite alternative approaches and open questions mentioned in the Discussion, TMT offers a useful framework in explaining how death guides human behavior. Nevertheless, in the name of science, I'd like to finish with the words of Karl Popper (1963), who once wrote that "it might be well for all of us to remember that, while differing widely in the various little bits we know, in our infinite ignorance we are all equal" (p. 38).

References

Abdollahi, A., Pyszczynski, T., Maxfield, M., & Luszczynska, A. (2011). Posttraumatic stress reactions as a disruption in anxiety-buffer functioning: Dissociation and responses to mortality salience as predictors of severity of posttraumatic symptoms. *Psychological Trauma: Theory, Research, Practice, and Policy*, *3*, 329–341.

Abrams, D., & Hogg, M. A. (1988). Comments on the motivational status of self-esteem in social identity and intergroup discrimination. *European Journal of Social Psychology*, *18*, 317–334.

Agroskin, D., & Jonas, E. (2013). Controlling death by defending ingroups—Mediational insights into terror management and control restoration. *Journal of Experimental Social Psychology*, *49*, 1144–1158.

Altemeyer, B., & Hunsberger, B. (1992). Authoritarianism, religious fundamentalism, quest, and prejudice. *The International Journal for the Psychology of Religion*, *2*, 113–133.

Anderson , J. R. (1976). *Language, memory, and thought.* Hillsdale, NJ: Lawrence Erlbaum.

Arndt, J., Greenberg, J., & Cook, A. (2002). Mortality salience and the spreading activation of worldview-relevant constructs: Exploring the cognitive architecture of terror management. *Journal of Experimental Psychology: General*, *131*, 307–324.

Arndt, J., Greenberg, J., Schimel, J., Pyszczynski, T., & Solomon, S. (2002). To belong or not to belong, that is the question: Terror Management and identification with gender and ethnicity. *Journal of Personality and Social Psychology*, *83*, 26–43.

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., Schimel, J., & Goldenberg, J. L. (2003). Death can be good for your health: Fitness intentions as a proximal and distal defense against mortality salience. *Journal of Applied Social Psychology*, *33*, 1726–1746.

Arndt, J., & Solomon, S. (2003). The control of death and the death of control: The effects of mortality salience, neuroticism, and worldview threat on the desire for control. *Journal of Research in Personality*, *37*, 1–22.

Arndt, J., Solomon, S., Kasser, T., & Sheldon, K. M. (2004). The urge to splurge: A terror management account of materialism and consumer behavior. *Journal of Consumer Psychology*, *14*, 198–212.

Axelrod, R. (1984). *The evolution of cooperation*. New York: Basic Books.

Baldwin, M. W., & Wesley, R. (1996). Effects of existential anxiety and self-esteem on the perception of others. *Basic and Applied Social Psychology*, *18*, 75–95.

Bargh, J. (2004). Being here now: Is consciousness necessary for human freedom?. In J. Greenberg, S. L., Koole, & T. Pyszczynski (Eds.), *Handbook of experimental existential psychology* (pp. 385–397). New York: Guilford.

Baumeister, R. F. (2005). *The cultural animal: Human nature, meaning, and social life.* New York: Oxford University Press.

Baumeister, R. F., Bushman, B. J., & Campbell, W. K. (2000). Self-esteem, narcissism, and aggression does violence result from low self-esteem or from threatened egotism?. *Current Directions in Psychological Science*, *9*, 26–29.

Baumeister, R. F., Smart, L., & Boden, J. M. (1996). Relation of threatened egotism to violence and aggression: the dark side of high self-esteem. *Psychological Review*, *103*, 5–33.

Becker, E. (1962). *The birth and death of meaning.* New York: Free Press.

Becker, E. (1972). *The denial of death.* New York: Free Press.

Becker, E. (1975). *Escape from evil.* New York: Free Press.

Berger, P. L., & Luckmann, T. (1967). *The social construction of reality.* New York: Anchor Books.

Bishin, B. G., Stevens, D., & Wilson, C. (2006). Character counts? Honesty and fairness in election 2000. *Public Opinion Quarterly*, *70*, 235–248.

Bond, C. F., Jr., & DePaulo, B. M. (2006). Accuracy of deception judgments. *Personality and Social Psychology Review*, *10*, 214–234.

Branscombe, N. R., & Wann, D. L. (1994). Collective self-esteem consequences of outgroup derogation when a valued social identity is on trial. *European Journal of Social Psychology*, *24*, 641–657.

Brown, K. W., Ryan, R. M., & Creswell, J. D. (2007). Mindfulness: Theoretical foundations and evidence for its salutary effects. *Psychological Inquiry*, *18*, 211–237.

Burger, J. M., & Cornelius, T. (2003). Raising the price of agreement: Public commitment and the low-ball compliance procedure. *Journal of Applied Social Psychology*, *33*, 923–934.

Burke, B. L., Martens, A., & Faucher, E. H. (2010). Two decades of terror management theory: A meta-analysis of mortality salience research. *Personality and Social Psychology Review*, *14*, 155–195.

Buunk, B. P., Jan Doosje, B., Jans, L. G., & Hopstaken, L. E. (1993). Perceived reciprocity, social support, and stress at work: The role of exchange and communal orientation. *Journal of Personality and Social Psychology*, *65*, 801–811.

Buunk, B. P., & Schaufeli, W. B. (1999). Reciprocity in interpersonal relationships: An evolutionary perspective on its importance for health and well-being. *European Review of Social Psychology*, *10*, 259–291.

Byrnes, J. P., Miller, D. C., & Schafer, W. D. (1999). Gender differences in risk-taking: A meta-analysis. *Psychological Bulletin*, *125*, 367–383.

Campbell, D. T. (1958). Common fate, similarity, and other indices of the status of aggregates of person as social entities. *Behavioural Science*, *3*, 14–25.

Castano, E., & Dechesne, M. (2005). On defeating death: Group reification and social identification as immortality strategies. *European Review of Social Psychology*, *16*, 221–255.

Castano, E., Yzerbyt, V., Paladino, M.-P., & Sacchi, S. (2002). I belong, therefore, I exist: Ingroup identification, ingroup entitativity, and ingroup bias. *Personality and Social Psychology Bulletin*, *28*, 135–143.

Cialdini, R. B., Cacioppo, J. T., Bassett, R., & Miller, J. A. (1978). Low-ball procedure for producing compliance: Commitment then cost. *Journal of Personality and Social Psychology*, *36*, 463–476.

Cialdini, R. B., Green, B. L., & Rusch, A. J. (1992). When Tactical Pronouncements of Change Become Real Change: The Case of Reciprocal *Persuasion Journal of Personality and Social Psychology*, *63*, 30–40.

Cialdini, R. B., & Goldstein, N. J. (2004). Social influence: Compliance and conformity. *Annual Review of Psychology*, *55*, 591–621.

Cialdini, R. B., Kallgren, C. A., & Reno, R. R. (1991). A focus theory of normative conduct: A theoretical refinement and reevaluation of the role of norms in human behavior. In L. Berkowitz (Ed.), *Advances in experimental social psychology*, Vol. 24. (pp. 201–234) San Diego, CA: Academic Press.

Cialdini, R. B., Reno, R. R., & Kallgren, C. A. (1990). A focus theory of normative conduct: Recycling the concept of norms to reduce littering in public places. *Journal of Personality and Social Psychology*, *58*, 1015–1026.

Cialdini, R. B., & Trost, M. R. (1998). Social influence: Social norms, conformity and compliance. In D. T. Gilbert, S. T. Fiske, & G. Lindzey (Eds.), *The handbook of social psychology* (4th ed., Vol. 2, pp. 151–192). New York: McGraw-Hill.

Cialdini, R. B., Vincent, J. E., Lewis, S. K., Catalan, J., Wheeler, D., & Darby, B. L. (1975). Reciprocal concessions procedure for inducing compliance: The door-in-the-face technique. *Journal of Personality and Social Psychology*, *32*, 206–215.

Collins, A. M., & Loftus, E. F. (1975). A spreading-activation theory of semantic processing. *Psychological Review*, *82*, 407–428.

Cozzolino, P. J. (2006). Death contemplation, growth, and defense: Converging evidence of dual systems? *Psychological Inquiry*, *17*, 278–287.

Cozzolino, P. J., Sheldon, K. M., Schachtman, T. R., & Meyers, L. S. (2009). Limited time perspective, values, and greed: Imagining a limited future reduces avarice in extrinsic people. *Journal of Research in Personality*, *43*, 399–408.

Cozzolino, P. J., Staples, A. D., Meyers, L. S., & Samboceti, J. (2004). Greed, death, and values: From terror management to transcendence management theory. *Personality and Social Psychology Bulletin*, *30*, 278–292.

Dechesne, M., Greenberg, J., Arndt, J., & Schimel, J. (2000). Terror management and the vicissitudes of sports fan affiliation: The effects of mortality salience on optimism and fan identification. *European Journal of Social Psychology*, *30*, 813–835.

Dechesne, M., Janssen, J., & Van Knippenberg, A. (2000). Derogation and distancing as terror management strategies: The moderating role of need for closure and permeability of group boundaries. *Journal of Personality and Social Psychology*, *79*, 923–932.

Dechesne, M., Pyszczynski, T., Arndt, J., Ransom, S., Sheldon, K. M, van Knippenberg, & Janssen. (2003). Literal and symbolic immortality: The effect of evidence of literal immortality on self-esteem striving in response to mortality salience. *Journal of Personality and Social Psychology*, *84*, 722–737.

Denissen, J. J. A., Penke, L., Schmitt, D. P., & van Aken, M. A. G. (2008). Self-esteem reactions to social interactions: Evidence for sociometer mechanisms across days, people, and nations. *Journal of Personality and Social Psychology*, *95*, 181–196.

Dillard, J. P. (1991). The current status of research on sequential-request compliance techniques. *Personality and Social Psychology Bulletin*, *17*, 283–288.

Dillard, J. P., Hunter, J. E., & Burgoon, M. (1984). Sequential-request persuasive strategies: Meta-analysis of foot-in-the-door and door-in-the-face. *Human Communication Research*, *10*, 461–488.

Du, H., Jonas, E., Klackl, J., Agroskin, D., Hui, E. K., & Ma, L. (2013). Cultural influences on terror management: Independent and interdependent self-esteem as anxiety buffers. *Journal of Experimental Social Psychology*, *49*, 1002–1011.

Echebarria-Echabe, A. (2013). Mortality salience and uncertainty: Similar effects but different processes?. *European Journal of Social Psychology*, *43*, 185–191.

Eisenberger, R., Lynch, P., Aselage, J., & Rohdieck, S. (2004). Who takes the most revenge? Individual differences in negative reciprocity norm endorsement. *Personality and Social Psychology Bulletin*, *30*, 787–799.

Edlund, J. E., Sagarin, B. J., & Johnson, B. S. (2007). Reciprocity and the belief in a just world. *Personality and Individual Differences*, *43*, 589–596.

Falk, A., & Szech, N. (2013). Morals and markets. *Science*, *340*, 707–711.

Feeley, T. H., Anker, A. E., & Aloe, A. M. (2012). The door-in-the-face persuasive message strategy: A meta-analysis of the first 35 years. *Communication Monographs*, *79*, 316–343.

Fern, E. F., Monroe, K. B., & Avila, R. A. (1986). Effectiveness of multiple request strategies: A synthesis of research results. *Journal of Marketing Research*, *23*, 144–152.

Festinger, L. (1954). A theory of social comparison processes. *Human Relations*, *7*, 117–140.

Fiedler, K., Kutzner, F., & Krueger, J. I. (2012). The long way from α-Error control to validity proper problems with a short-sighted false-positive debate. *Perspectives on Psychological Science*, *7*, 661–669.

Field, A. J. (2004). *Altruistically inclined? The behavioural sciences, evolutionary theory, and the origins of reciprocity.* Ann Arbor: University of Michigan Press.

Fritsche, I., & Häfner, K. (2012). The malicious effects of existential threat on motivation to protect the natural environment and the role of environmental identity as a moderator. *Environment and Behavior*, *44*, 570–590.

Fritsche, I., Jonas, E., & Fankhänel, T. (2008). The role of control motivation in mortality salience effects on ingroup support and defense. *Journal of Personality and Social Psychology*, *95*, 524–541.

Fritsche, I., Jonas, E., & Kessler, T. (2011). Collective reactions to threat: Implications for intergroup conflict and for solving societal crises. *Social Issues and Policy Review*, *5*, 101–136.

Fritsche, I., Jonas, E., Niesta Kayser, D., & Koranyi, N. (2010). Existential threat and compliance with pro-environmental norms. *Journal of Environmental Psychology*, *30*, 67–79.

Fox, J., & Guyer, M. (1978). Public choice and cooperation in n-person prisoner's dilemma. *Journal of Conflict Resolution*, *22*, 469–481.

Gailliot, M., Schmeichel, B., & Baumeister, R. (2006). Self-regulatory processes defend against the threat of death: Effects of self-control depletion and trait self-control on thoughts and fears of dying. *Journal of Personality and Social Psychology*, *91*, 49–62.

Gailliot, M. T., Stillman, T. F., Schmeichel, B. J., Maner, J. K., & Plant, E. A. (2008). Mortality salience increases adherence to salient norms and values. *Personality and Social Psychology Bulletin*, *34*, 993–1003.

Geißler, H., Schöpe, S., Klewes, J., Rauh, C., & von Alemann, U. (2013). Wertestudie 2013: Wie groß ist die Kluft zwischen dem Volk und seinen Vertretern? Köln: YouGov.

Giannakakis, A. E., & Fritsche, I. (2011). Social Identities, Group Norms, and Threat: On the Malleability of Ingroup Bias. *Personality and Social Psychology Bulletin*, *37*, 82–93.

Goffman, E. (1959). *The presentation of self in everyday life.* New York: Anchor Books.

Goldenberg, J. L. (2005). The body stripped down: An existential account of the threat posed by the physical body. *Current Directions in Psychological Science*, *14*, 224–228.

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.

Goldstein, N. J., & Cialdini, R. B. (2007). The spyglass self: A model of vicarious self-perception. *Journal of Personality and Social Psychology*, *92*, 402–417.

Gouldner, A. (1960). The norm of reciprocity: A preliminary statement, *Journal of Social and Personal Relationships*, *2*, 351–375.

Greenberg, J., & Kosloff, S. (2008). Terror management theory: Implications for understanding prejudice, stereotyping, intergroup conflict, and political attitudes. *Social and Personality Psychology Compass*, *2*, 1881–1894.

Greenberg, J., Kosloff, S., Solomon, S., Cohen, F., & Landau, M. J. (2010). Toward understanding the fame game: The effect of mortality salience on the appeal of fame. *Self and Identity*, *9*, 1–18.

Greenberg, J., Landau, M.J., Solomon, S., & Pyszczynski, T. (in press). The case for terror management as the primary psychological function of religion. In D. Wulff (Ed.), *Handbook of the Psychology of Religion.* London: Oxford University Press

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., Rosenblatt, A., Veeder, M., Kirkland, S., & Lyon, D. (1990). Evidence for terror management theory: II. The effects of mortality salience reactions to those who threaten or bolster the cultural worldview. *Journal of Personality and Social Psychology*, *58*, 308–318.

Greenberg, J., Simon, L., Porteus, J., Pyszczynski, T., & Solomon, S. (1995). Evidence of a terror management function of cultural icons: The effects of mortality salience on the inappropriate use of cherished cultural symbols. *Personality and Social Psychology Bulletin*, *21*, 1221–1228.

Greenberg, J., Simon, L., Pyszczynski, T., Solomon, S., & Chatel, D. (1992). Terror management and tolerance: Does mortality salience always intensify negative reactions to others who threaten one's worldview? *Journal of Personality and Social Psychology*, *63*, 212–220.

Greenberg, J., Solomon, S., & Arndt, J. (2008). A basic but uniquely human motivation: Terror management. In J. Y. Shah, W. L. Gardner (Eds.), *Handbook of motivation science* (pp. 114–134). New York: Guilford Press.

Greenberg, J., Solomon, S., & Pyszczynski, T. (1997). Terror management theory of self-esteem and cultural world-views: Empirical assessment and conceptual refinements. In M. P. Zanna (ed.), *Advances in Experimental Psychology* (Vol. 29, pp. 61–139). New York: Academic Press.

Greenberg, J., Solomon, S., Pyszczynski, T., Rosenblatt, A., Burling, J., Lyon, D., Pinel, E., & Simon, L. (1992). Why do people need self-esteem? Converging evidence that self-esteem serves an anxiety-buffering function. *Journal of Personality and Social Psychology*, *63*, 913–922.

Greenwald, G., MacAskill, E., & Poitras, L. (2013, June 9). Edward Snowden: The whistleblower behind the NSA surveillance revelations. *The Guardian*. Retrieved from

http://www.theguardian.com/world/2013/jun/09/edward-snowden-nsa-whistleblower-surveillance

Guéguen, N., Pascual, A., & Dagot, L. (2002). Low-ball and compliance to a request: An application in a field setting. *Psychological Reports*, *91*, 81–84.

Hansen, J., Winzeler, S., & Topolinski, S. (2010). When the death makes you smoke: A terror management perspective on the effectiveness of cigarette on-pack warnings. *Journal of Experimental Social Psychology*, 46, 226–228.

Harmon-Jones, E., Greenberg, J., Solomon, S., & Simon, L. (1996). The effects of mortality salience on intergroup bias between minimal groups. *European Journal of Social Psychology*, *26*, 677–681.

Hathaway, L. M., Boals, A., & Banks, J. B. (2010). PTSD symptoms and dominant emotional response to a traumatic event: An examination of DSM-IV criterion A2. *Anxiety, Stress, and Coping: An International Journal*, *23*, 119–126.

Hayes, J., Schimel, J., Arndt, J., & Faucher, E. H. (2010). A theoretical and empirical review of the death-thought accessibility concept in terror management research. *Psychological bulletin*, *136*, 699–739.

Hayes, J., Schimel, J., & Williams, T. J. (2008). Fighting death with death: The buffering effects of learning that worldview violators have died. *Psychological Science*, *19*, 501–507.

Higgins, E. T., & Bargh, J. E. (1987). Social cognition and social perception. *Annual Review of Psychology*, *38*, 369–425.

Hillhouse, J., Turrisi, R., Holwiski, F., & McVeigh, S. (1999). An examination of psychological variables relevant to artificial tanning tendencies. *Journal of Health Psychology*, *4*, 507–516.

Hirschberger, G., Florian, V., & Mikulincer, M. (2003). Strivings for romantic intimacy following partner complaint or partner criticism: A terror management perspective. *Journal of Social and Personal Relationships*, *20*, 675–688.

Hirschberger, G., Florian, V., Mikulincer, M., Goldenberg, J. L., & Pyszczynski, T. (2002). Gender differences in the willingness to engage in risky behavior: A terror management perspective. *Death Studies*, *26*, 117–141.

Hogg, M. A., & Reid, S. A. (2006). Social categorization and human communication: The social identity perceptive and group norms. *Communication Theory*, *16*, 7–30.

Joireman, J., & Duell, B. (2005). Mother Teresa versus Ebenezer Scrooge: Mortality salience leads proselfs to endorse self-transcendent values (unless proselfs are reassured). *Personality and Social Psychology Bulletin*, *31*, 307–320.

Joireman, J., & Duell, B. (2007). Self-transcendent values moderate the impact of mortality salience on support for charities. *Personality and Individual Differences*, *43*, 779–789.

Jonas, E., & Fritsche, I. (2012). Follow the norm! Terror management theory and the influence of descriptive norms. *Social Psychology*, *43*, 28–32.

Jonas, E., & Fritsche, I. (2013). Destined to die but not to wage war: How existential threat can contribute to escalation or de-escalation of violent intergroup conflict. *American Psychologist*, *68*, 543–558.

Jonas, E., & Greenberg, J. (2013). Generosity, greed, norms, and death–Differential effects of mortality salience on charitable behavior. *Journal of Economic Psychology*, *35*, 47–57.

Jonas, E., Martens, A., Niesta, D., Fritsche, I., Sullivan, D., & Greenberg, J. (2008). Focus theory of normative conduct and terror management theory: The interactive impact of mortality salience and norm salience on social judgment. *Journal of Personality and Social Psychology*, *95*, 1239–1251.

Jonas, E., McGregor, I., Klackl, J., Agroskin, D., Fritsche, I., Holbrook, C., Nash, K., Proulx, T., & Quirin, M. (2014). Threat and defense: From anxiety to approach. *Advances in Experimental Social Psychology*, *49*, 219–286.

Jonas, E., Schimel, J., Greenberg, J., & Pyszczynski, T. (2002). The Scrooge effect: Evidence that mortality salience increases pro-social attitudes and behavior. *Personality and Social Psychology Bulletin*, *28*, 1342–1353.

Juhl, J., & Routledge, C. (2010). Structured terror: Further exploring the effects of mortality salience and personal need for structure on worldview defense. *Journal of Personality*, *78*, 969–990.

Kallgren, C. A., Reno, R. R., & Cialdini, R. B. (2000). A focus theory of normative conduct: When norms do and do not affect behavior. *Personality and Social Psychology Bulletin*, *26*, 1002–1012.

Kashima, E. S. (2010). Culture and Terror Management: What is "Culture" in Cultural Psychology and Terror Management Theory?. *Social and Personality Psychology Compass*, *4*, 164–173.

Kashy, D. A., & DePaulo, B. M. (1996). Who lies?. *Journal of Personality and Social Psychology*, *70*, 1037–1051.

Kasser, T., & Sheldon, K. M. (2000). Of wealth and death: Materialism, mortality salience, and consumption behavior. *Psychological Science*, *11*, 348–351.

Koole, S. L., & Van den Berg, A. E. (2005). Lost in the wilderness: Terror management, action orientation, and evaluations of nature. *Journal of Personality and Social Psychology*, *88*, 1014–1028.

Lam, S. R., Morrison, K. R., & Smeesters, D. (2009). Gender, intimacy, and risky sex: A terror management account. *Personality and Social Psychology Bulletin*, *35*, 1046–1056.

Landau, M. J., Solomon, S., Greenberg, J., Cohen, F., Pyszczynski, T., Arndt, J., Miller, C. H., Ogilvie, D. M., & 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.

Landau, M. J., Sullivan, D., & Solomon, S. (2010). On graves and graven images: A terror management analysis of the psychological functions of art. *European Review of Social Psychology*, *21*, 114–154.

Leary, M. R. (1999). The social and psychological importance of self-esteem. In R. M. Kowalski & M. R. Leary (Eds.), *The social psychology of emotional and behavioral problems: Interfaces of social and clinical psychology* (pp. 197–221). Washington, DC: American Psychological Association.

Leary, M. R. (2004). The function of self-esteem in terror management theory and sociometer theory: Comment on Pyszczynski et al. (2004). *Psychological Bulletin*, *130*, 478–482.

Leary, M. R., & Baumeister, R. F. (2000). The nature and function of self-esteem: Sociometer theory. In M. P. Zanna (Ed.), *Advances in experimental social psychology* (Vol. 32, pp. 1–62). New York: Academic Press.

Leary, M. R., Haupt, A. L., Strausser, K. S., & Chokel, J. T. (1998). Calibrating the sociometer: The relationship between interpersonal appraisals and state self-esteem. *Journal of Personality and Social Psychology*, *74*, 1290–1299.

Leary, M., & Jones, J. (1994). The social psychology of tanning and sunscreen use: Self-presentational motives as a predictor of health risk. *Journal of Applied Social Psychology*, *23*, 1390–1406.

Leary, M. R., Tambor, E. S., Terdal, S. K., & Downs, D. L. (1995). Self-esteem as an interpersonal monitor: The sociometer hypothesis. *Journal of Personality and Social Psychology*, *68*, 518–518.

Liberman, V., Samuels, S. M., & Ross, L. (2004). The name of the game: Predictive power of reputations versus situational labels in determining prisoner's dilemma game moves. *Personality and Social Psychology Bulletin*, *30*, 1175–1185.

Maheswaran, D., & Agrawal, N. (2004). Motivational and cultural variations in mortality salience effects: Contemplations on terror management theory and consumer behavior. *Journal of Consumer Psychology*, *14*, 213–218.

Mandel, N., & Heine, S. J. (1999). Terror management and marketing: He who dies with the most toys wins. *Advances in Consumer Research*, *26*, 527–532.

Martens, A., Burke, B. L., Schimel, J., & Faucher, E. H. (2011) Same but different: Meta-analytically examining the uniqueness of mortality salience effects. *European Journal of Social Psychology*, *41*, 6–10.

McCornack, S. A., & Parks, M. R. (1986). Deception detection and relationship development: The other side of trust. *Communication Yearbook*, *9*, 377–389.

McGregor, H., Lieberman, J. D., Solomon, S., Greenberg, J., Arndt, J., Simon, L., et al. (1998). Terror management and aggression: Evidence that mortality salience motivates aggression against worldview threatening others. *Journal of Personality and Social Psychology*, *74*, 590–605.

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

Mummendey, A., Klink, A., & Brown, R. (2001). Nationalism and patriotism: National identification and out-group rejection. *British Journal of Social Psychology*, *40*, 159–172.

Murstein, B. I., Cerreto, M., & MacDonald, M. G. (1977). A theory and investigation of the effect of exchange orientation on marriage and friendship. *Journal of Marriage and the Family*, *39*, 543–548.

Niemiec, C. P., Brown, K. W., Kashdan, T. B., Cozzolino, P. J., Breen, W., Levesque, C., et al. (2010). Being present in the face of existential threat: The role of trait mindfulness in reducing defensive responses to mortality salience. *Journal of Personality and Social Psychology*, *99*, 344–365.

Niesta, D., Fritsche, I., & Jonas, E. (2008). Mortality salience and its effects on peace processes: A review. *Social Psychology*, *39*, 48–58.

O'Keefe, D. J., & Hale, S. L. (1998). The door-in-the-face influence strategy: A random-effects meta-analytic review. In M. E. Roloff (Ed.), *Communication yearbook 21* (pp. 1–33). Thousand Oaks, CA: Sage.

Ostrom, E. (2000). Collective action and the evolution of social norms. *Journal of Economic Perspectives*, *14*, 137–158.

Perugini, M., Gallucci, M., Presaghi, F., & Ercolani, A. P. (2003). The personal norm of reciprocity. *European Journal of Personality*, *17*, 251–283.

Peterson, C., & Seligman, M. E. P. (2003). Character strengths before and after September 11. *Psychological Science*, *14*, 381–384.

Pfattheicher, S., Landhäußer, A., & Keller, J. (in press). Individual differences in antisocial punishment in public goods situations: The interplay of cortisol with testosterone and dominance. *Journal of Behavioral Decision Making*.

Pliner, P., Chaiken, S., & Flett, G. L. (1990). Gender differences in concern with body weight and physical appearance over the life span. *Personality and Social Psychology Bulletin*, *16*, 263–273.

Popper, K. (1963). *Conjectures and Refutations. The Growth of Scientific Knowledge.* London and New York.

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*, 525–537.

Pyszczynksi, 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.

Pyszczynski, T., & Kesebir, P. (2012). Culture, ideology, morality, and religion: Death changes everything. In P. R. Shaver, & M. Mikulincer (Eds.), *Meaning, mortality, and choice: The social psychology of existential concerns* (pp. 75–91). Washington D.C.: American Psychological Association.

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

Reno, R. R., Cialdini, R. B., & Kallgren, C. A. (1993). The transsituational influence of social norms. *Journal of Personality and Social Psychology*, *64*, 104–112.

Regan, D. (1971). Effects of a favor and liking on compliance. *Journal of Experimental Social Psychology*, *7*, 627–639.

Reinhard, M.-A., Schindler, S., & Stahlberg, D. (2014). The risk of male success and failure: How performance outcomes along with a high-status identity effect gender identification, risk behavior, and self-esteem. *Group Processes and Intergroup Relations*, *17*, 200–220.

Reinhard, M.-A., Stahlberg, D., & Messner, M. (2009). When failing feels good—Relative prototypicality for a high-status group can counteract ego-threat after individual failure. *Journal of Experimental Social Psychology*, *45*, 788–795.

Renkema, L. J., Stapel, D. A., & Van Yperen, N. W. (2008). Go with the flow: Conforming to others in the face of existential threat. *European Journal of Social Psychology*, *38*, 747–756.

Rind, B., & Strohmetz, D. (1999). Effect on restaurant tipping of a helpful message written on the back of customer's checks. *Journal of Applied Social Psychology*, *29*, 139–144.

Rosenblatt, A., Greenberg, J., Solomon, S., Pyszczynski, T., & Lyon, D. (1989). Evidence for terror management theory I: The effects of mortality salience on reactions to those who violate or uphold cultural values. *Journal of Personality and Social Psychology*, *57*, 681–690.

Rothschild, Z., Abdollahi, A., & Pyszczynski, T. (2009). Does peace have a prayer? The effect of mortality salience, compassionate values, and religious fundamentalism on hostility toward out-groups. *Journal of Experimental Social Psychology*, *45*, 816–827.

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

Schimel, J., Simon, L., Greenberg, J., Pyszczynski, T., Solomon, S., Waxmonski, J., & Arndt, J. (1999). Support for a functional perspective on stereotypes: Evidence that mortality salience enhances stereotypic thinking and preferences. *Journal of Personality and Social Psychology*, *77*, 905–926.

Schindler, S., Pfattheicher, S., & Reinhard, M.-A. (2014). *A hero in the name of truth: Mortality salience increases heroic perceptions of Edward Snowden.* Manuscript submitted for publication.

Schindler, S., Reinhard, M.-A., & Stahlberg, D. (2012). Mortality salience increases personal relevance of the norm of reciprocity. *Psychological Reports*, *111*, 565–574.

Schindler, S., Reinhard, M.-A., & Stahlberg, D. (2013). Tit for tat in the face of death: The effect of mortality salience on reciprocal behavior. *Journal of Experimental Social Psychology*, *49*, 87–92.

Schindler, S., & Reinhard, M.-A. (2014a). *Increasing scepticism towards potential liars: Effects of existential threat and value priming on veracity judgments.* Manuscript submitted for publication.

Schindler, S., & Reinhard, M.-A. (2014b). *When death is compelling: Door-in-the-face compliance under mortality salience.* Manuscript submitted for publication.

Schindler, S., Reinhard, M.-A., Stahlberg, D., & Len, A. (in press). Quid pro quo: The effect of individuals' exchange orientation on prosocial behavior and the moderating role of mortality salience. *Social Influence.*

Schwartz, S. H. (1973). Normative explanations of helping behavior: A critique, proposal, and empirical test. *Journal of Experimental Social Psychology*, *9*, 349–364.

Schwartz, S. H. (1992). Universals in the content and structure of values: Theoretical advances and empirical tests in 20 countries. *Advances in Experimental Social Psychology*, *25*, 1–65.

Schwartz, S. H., & Bilsky, W. (1990). Toward a theory of the universal content and structure of values: Extensions and cross-cultural replications. *Journal of Personality and Social Psychology*, *58*, 878–891.

Sherman, S. J., Hamilton, D. L., & Lewis, A. C. (1999). Perceived entitativity and the social identity value of group memberships. In D. Abrahams & M. A. Hogg (Eds.), *Social identity and social cognition* (pp. 80–110). Cambridge, MA: Blackwell.

Shi, D. (1985). *The simple life.* New York: Oxford University Press.

Solomon, S., Greenberg, J., & Pyszczynski, T. (2004). The cultural animal: Twenty years of terror management theory and research. In J. Greenberg, S. L., Koole, & T. Pyszczynski (Eds.), *Handbook of experimental existential psychology* (pp. 13–34). New York: Guilford.

Solomon, S., Greenberg, J., Schimel, J., Arndt, J, & Pyszczynski, T. (2004). Human awareness of mortality and the evolution of culture. In M. Schaller & C. Crandall (Eds.). *The psychological foundations of culture.* (pp. 15-40). New York: Erlbaum.

Srivastava, S., & Beer, J. S. (2005). How self-evaluations relate to being liked by others: Integrating sociometer and attachment perspectives. *Journal of Personality and Social Psychology*, *89*, 966–977.

Steele, C. M. (1975). Name calling and compliance. *Journal of Personality and Social Psychology*, *31*, 361–369.

Szücs, A., Schindler, S., Reinhard, M.-A., & Stahlberg, D. (2014). When being a bad friend doesn't hurt: The buffering function of gender typicality against self-esteem threatening feedback. *Swiss Journal of Social Psychology*, *73*, 97–103.

Tajfel, H. (1982). Social psychology of intergroup relations. *Annual Review of Psychology*, *33*, 1–9.

Tajfel, H., & Turner, J. C. (1979). An integrative theory of intergroup conflict. In W. G. Austin & S. Worchel (Eds.), *The social psychology of intergroup relations* (pp. 33–47). Monterey, CA: Brooks/Cole.

Tedeschi, R. G., & Calhoun, L. G. (2004). Posttraumatic growth: Conceptual foundations and empirical evidence. *Psychological Inquiry*, *15*, 1–18.

Turner, J. C. (1987). The analysis of social influence. In J. C. Turner, M. A. Hogg, P. J. Oakes, S. D. Reicher, & M. S. Wetherell (Eds.), *Rediscovering the social group: A self-categorization theory* (pp. 68–88). Oxford, UK: Blackwell.

Taubman Ben-Ari, O., & Findler, L. (2003). Reckless driving and gender: An examination of a terror management theory explanation. *Death Studies*, *27*, 603–618.

Taubman Ben-Ari, O., Findler, L., & Mikulincer, M. (2002). The effects of mortality salience on relationship strivings and beliefs: The moderating role of attachment style. *British Journal of Social Psychology*, *41*, 419–441.

Taubman Ben-Ari, O., Florian, V., & Mikulincer, M. (1999). The impact of mortality salience on reckless driving: A test of terror management mechanisms. *Journal of Personality and Social Psychology*, *76*, 35–45.

Vail, K. E., Arndt, J., & Abdollahi, A. (2012). Exploring the existential function of religion and supernatural agent beliefs among Christians, Muslims, Atheists, and Agnostics. *Personality and Social Psychology Bulletin*, *38*, 1288–1300.

Vail, K. E., Juhl, J., Arndt, J., Vess, M., Routledge, C., & Rutjens, B. T. (2012). When death is good for life: Considering the positive trajectories of terror management. *Personality and Social Psychology Review*, *16*, 303–329.

Vail, K. E., Rampy, N., Arndt, J., Pope, J. B., & Pinel, E. (2011). *Intolerance of intolerance: Mortality salience, tolerant values, and attitudes toward an anti-Muslim leader.* Unpublished manuscript, University of Missouri-Columbia.

Vail, K. E., Rothschild, Z. K., Weise, D., Solomon, S., Pyszczynski, T., & Greenberg, J. (2010). A terror management analysis of the psychological functions of religion. *Personality and Social Psychology Review*, *14*, 84–94.

van den Bos, K., Poortvliet, P. M., Maas, M., Miedema, J., & van den Ham, E. (2005). An enquiry concerning the principles of cultural norms and values: The impact of uncertainty and mortality salience on reactions to violations and bolstering of cultural worldviews. *Journal of Experimental Social Psychology*, *41*, 91–113.

Vess, M., & Arndt, J. (2008). The nature of death and the death of nature: the impact of mortality salience on environmental concern. *Journal of Research in Personality*, *42*, 1376–1380.

Vess, M., Routledge, C., Landau, M. J., & Arndt, J. (2009). The dynamics of death and meaning: The effects of death-relevant cognitions and personal need for structure on perceptions of meaning in life. *Journal of Personality and Social Psychology*, *97*, 728–744.

Vrij, A. (2000). *Detecting lies and deceit. The psychology of lying and the implications for professional practice.* Chichester: John Wiley.

Weber, M., & Ruch, W. (2012). The role of character strengths in adolescent romantic relationships: An initial study on partner selection and mates' life satisfaction. *Journal of Adolescence*, *35*, 1537–1546.

Whatley, M. A., Webster, J. M., Smith, R. H., & Rhodes, A. (1999). The effect of a favor on public and private compliance: how internalized is the norm of reciprocity. *Basic and Applied Social Psychology*, *21*, 251–259.

Wisman, A., & Koole, S. L. (2003). Hiding in the crowd: Can mortality salience promote affiliation with others who oppose one's worldview? *Journal of Personality and Social Psychology*, *84*, 511–526.

Yalom, I. (1980). *Existential psychotherapy*. New York: Basic Books.

Zuckerman, M. (1979). *Sensation seeking: Beyond the optimal level of arousal.* Hillsdale, NJ: Erlbaum.

ACKNOWLEDGMENTS

This work is based on curiosity, pain, anxiety, and above all, deep gratitude. Essentially, Marc, I thank you for NOT having always been there for me when I wanted you to be, and for having kicked my butt when I wallowed in "narcissistic self-pity" (as you named it). I know if you'd see me now writing acknowledgments, you'd tell me to stop doing such unnecessary sentimental things and instead to start working on a new publication. That's you. And I had (and sometimes still have) a hard time learning that I'm not you. Thanks for introducing me to the world of science (especially on the road) and for teaching me the value of critical rationalism (though being sceptical about everything is sometimes really exhausting).

Dagmar, thank you for having provided me the opportunity to work with the kindest chair in the world (big hug to Christiane, Dorothee, Janin, Apo, and also to Bianca, Katharina, Jenny, Axel, and Sabine). Herbert, thank you for hardening me through the sometimes tough discussion in the CDSS colloquium ("Bless you"). Arndt Bröder, thank you for having reduced my fear of failing. Ste, thank you for just being a great friend and colleague—seeing you is always an inspiration on all levels. Simse, thank you for very relaxed times full of confusing talks and laughter. Hannfredo, thank you for sharing your incredibly positive energy with me. Hannah, thank you having acquainted me with this exiting social psychological theory about how people cope with the threat of death. Ann, thank you for those many painful words that shattered my limited concept of Simon Schindler. Martin, thank you for having danced with me.

Mum, thank you for having offered me the deeply anchored belief that no matter what happens, there is always a positive side. Paps, somehow I can't get rid of the feeling that in a certain way, this dissertation is based on the motivation to make you proud. So, I guess you played a large part here—thank you for donating to me the ambition to create. Timo and Yvonne, sorry for having been a brotherly ruffian—I hope to do better now. Verena, thank

you for accompanying me through the adventurous journey of life. You are my most important anxiety-buffer—I love you. Last, I thank myself.

STATEMENT OF ORIGINALITY

Universität Kassel, Fachbereich Humanwissenschaften

Erklärung zur kumulativen Dissertationen im Promotionsfach Psychologie

Erklärung über den Eigenanteil an den veröffentlichten oder zur Veröffentlichung vorgesehenen wissenschaftlichen Schriften innerhalb meiner Dissertationsschrift, Ergänzung zu § 5a Abs. 4 Satz 1 der Allgemeinen Bestimmungen für Promotionen an der Universität Kassel vom 13. Juni 2011

1. Allgemeine Angaben

Schindler, Simon
Institut für Psychologie, Universität Kassel
Thema der Dissertation: „How Death Guides Human Behavior – The Role of Cultural Norms and Values in Terror Management Theory"

2. Nummerierte Aufstellung der eingereichten Schriften (Reihenfolge gemäß der Erwähnung in der Synopse)

1. Seibert, A., Schindler, S., & Reinhard, M.-A. (in press). The heavy weight of death: How anti-fat bias is affected by weight-based group membership and existential threat. *Journal of Applied Social Psychology.*
2. Pfattheicher, S., & Schindler, S. (2014). *Understanding the evil side of costly punishment: When everyday sadists punish cooperative others facing existential threat.* Manuscript submitted for publication.
3. Schindler, S., Reinhard, M.-A., Stahlberg, D., & Len, A. (2014). Quid pro quo: The effect of individuals' exchange orientation on prosocial behavior and the moderating role of mortality salience. *Social Influence*, *9*, 242–254.
4. Schindler, S., Pfattheicher, S., & Reinhard, M.-A. (2014). *A hero in the name of truth: Mortality salience increases heroic perceptions of Edward Snowden.* Manuscript submitted for publication.
5. Schindler, S., & Reinhard, M.-A. (2014). *Increasing scepticism towards potential liars: Effects of existential threat and value priming on veracity judgments.* Manuscript submitted for publication.
6. Schindler, S., Reinhard, M.-A., & Stahlberg, D. (2012). Mortality salience increases personal relevance of the norm of reciprocity. *Psychological Reports*, *111*, 565–574.
7. Schindler, S., Reinhard, M.-A., & Stahlberg, D. (2013). Tit for tat in the face of death: The effect of mortality salience on reciprocal behavior. *Journal of Experimental Social Psychology*, *49*, 87–92.
8. Schindler, S., & Reinhard, M.-A. (2014). *When death is compelling: Door-in-the-face compliance under mortality salience.* Manuscript submitted for publication.

3. Darlegung des eigenen Anteils an diesen Schriften

Zu Nr. 1:
- Entwicklung der Konzeption: in Teilen
- Literaturrecherche: in Teilen
- Methodenentwicklung: in Teilen
- Entwicklung des Versuchsdesigns: in Teilen
- Datenerhebung: in Teilen
- Datenauswertung: in Teilen
- Ergebnisdiskussion: in Teilen
- Erstellen des Manuskripts: in Teilen
- Überarbeiten nach 1. Review: mehrheitlich

Zu Nr. 2:
- Entwicklung der Konzeption: in Teilen
- Literaturrecherche: in Teilen
- Methodenentwicklung: in Teilen
- Entwicklung des Versuchsdesigns: in Teilen
- Datenerhebung: in Teilen
- Datenauswertung: in Teilen
- Ergebnisdiskussion: in Teilen
- Erstellen des Manuskripts: in Teilen

Zu Nr. 3:
- Entwicklung der Konzeption: überwiegend
- Literaturrecherche: vollständig
- Methodenentwicklung: überwiegend
- Entwicklung des Versuchsdesigns: überwiegend
- Datenerhebung: in Teilen
- Datenauswertung: vollständig
- Ergebnisdiskussion: überwiegend
- Erstellen des Manuskripts: vollständig

Zu Nr. 4:
- Entwicklung der Konzeption: vollständig
- Literaturrecherche: vollständig
- Methodenentwicklung: vollständig
- Entwicklung des Versuchsdesigns: vollständig
- Datenerhebung: vollständig
- Datenauswertung: vollständig
- Ergebnisdiskussion: überwiegend
- Erstellen des Manuskripts: vollständig
- Bewältigung des Review-Prozesses: überwiegend

Zu Nr. 5:
- Entwicklung der Konzeption: vollständig
- Literaturrecherche: vollständig
- Methodenentwicklung: vollständig
- Entwicklung des Versuchsdesigns: vollständig
- Datenerhebung: in Teilen
- Datenauswertung: vollständig
- Ergebnisdiskussion: überwiegend
- Erstellen des Manuskripts: vollständig
- Bewältigung des Review-Prozesses: überwiegend

Zu Nr. 6:
- Entwicklung der Konzeption: vollständig
- Literaturrecherche: vollständig
- Methodenentwicklung: vollständig
- Entwicklung des Versuchsdesigns: vollständig
- Datenerhebung: in Teilen
- Datenauswertung: vollständig
- Ergebnisdiskussion: überwiegend
- Erstellen des Manuskripts: vollständig
- Bewältigung des Review-Prozesses: überwiegend

Zu Nr. 7:
- Entwicklung der Konzeption: vollständig
- Literaturrecherche: überwiegend
- Methodenentwicklung: überwiegend
- Entwicklung des Versuchsdesigns: vollständig
- Datenerhebung: in Teilen
- Datenauswertung: überwiegend
- Ergebnisdiskussion: überwiegend
- Erstellen des Manuskripts: überwiegend
- Bewältigung des Review-Prozesses: überwiegend

Zu Nr. 8:
- Entwicklung der Konzeption: vollständig
- Literaturrecherche: vollständig
- Methodenentwicklung: vollständig
- Entwicklung des Versuchsdesigns: vollständig
- Datenerhebung: vollständig
- Datenauswertung: vollständig
- Ergebnisdiskussion: überwiegend
- Erstellen des Manuskripts: überwiegend

4. Anschriften der Mitautoren

Marc-André Reinhard: reinhard@psychologie.uni-kassel.de
Dagmar Stahlberg: dstahlberg@sowi.uni-mannheim.de
Andrea Len: alen@rumms.uni-mannheim.de
Stefan Pfattheicher: stefan.pfattheicher@uni-ulm.de
Ann Seibert: aseibert@mail.uni-mannheim.de

Unterschrift des Antragstellers:

_____

Datum Dipl.-Soz. Simon Schindler

Ich bestätige die von Herrn Schindler unter Pkt. 3 abgegebene Erklärung:

1.

Prof. Dr. Marc-André Reinhard Unterschrift:……

2.

Prof. Dr. Dagmar Stahlberg Unterschrift:……

3.

Dipl.-Soz. Stefan Pfattheicher Unterschrift:……

4.

Ann Seibert B.Sc. Unterschrift:……

5.

Dipl.-Psych. Andrea Len Unterschrift:……

Eidesstattliche Versicherung und Erklärung

Hiermit versichere ich, dass ich die vorliegende Dissertation selbstständig, ohne unerlaubte Hilfe Dritter angefertigt und andere als die in der Dissertation angegebenen Hilfsmittel nicht benutzt habe. Alle Stellen, die wörtlich oder sinngemäß aus veröffentlichten oder unveröffentlichten Schriften entnommen sind, habe ich als solche kenntlich gemacht. Dritte waren an der inhaltlich-materiellen Erstellung der Dissertation nicht beteiligt; insbesondere habe ich hierfür nicht die Hilfe eines Promotionsberaters in Anspruch genommen. Kein Teil dieser Arbeit ist in einem anderen Promotions- oder Habilitationsverfahren verwendet worden.

_____

Datum Dipl.-Soz. Simon Schindler

FURTHER PUBLISHED MANUSCRIPTS

The following five articles are related to other lines of research and are therefore not an integral part of this thesis (however, two articles are shortly mentioned: Reinhard, Schindler, & Stahlberg, 2014; Szücs, Schindler, Reinhard, & Stahlberg, 2014):

Reinhard, M.-A., Schindler, S., & Stahlberg, D. (2014). The risk of male success and failure: How performance outcomes along with a high-status identity effect gender identification, risk behavior, and self-esteem. *Group Processes and Intergroup Relations*, *17*, 200–220.

Reinhard, M.-A., Schindler, S., Raabe, V., Stahlberg, D., & Messner, M. (2014). Less is sometimes more: How repetition of an antismoking advertisement affects attitudes toward smoking and source credibility. *Social Influence*, *9*, 116–132.

Szücs, A., Schindler, S., Reinhard, M.-A., & Stahlberg, D. (2014). When being a bad friend doesn't hurt: The buffering function of gender typicality against self-esteem threatening feedback. *Swiss Journal of Social Psychology*, *73*, 97–103.

Reinhard, M.-A., Schindler, S., Messner, M., Stahlberg, D., & Mucha, N. (2011). "I don't know anything about soccer": How personal weaknesses and strengths guide inferences about women's qualification in sex-typed jobs. *Swiss Journal of Psychology*, *70*, 149–154.

Schindler, S., Reinhard, M.-A., & Stahlberg, D. (2011). Repetition of educational AIDS advertising affects attitudes. *Psychological Reports*, *108*, 693–698.

APPENDIX: COPIES OF ARTICLES

APPENDIX A

Seibert, A., Schindler, S., & Reinhard, M.-A. (in press). The heavy weight of death: How anti-fat bias is affected by weight-based group membership and existential threat. *Journal of Applied Social Psychology*.

This is the version that was originally submitted to the journal for peer review.

The Heavy Weight of Death: How Anti-Fat Bias is Affected by Weight-Based Group Membership and Existential Threat

Word count	
Abstract:	126
Main text:	3.550
References:	1.408
Footnotes:	134

Abstract

Anti-fat bias is marked by a devaluation of overweight people in comparison to non-overweight persons. Even though belonging to the same group, research on social identity theory indicates that overweight people also devaluate overweight others. Merging insights from research on anti-fat bias, social identity theory, and terror management theory, the present study ($N = 101$) aimed to provide new insights on motivational aspects of anti-fat bias by investigating the effects of existential threat on the evaluation of non-overweight and overweight people. Results revealed participants in the existential threat condition to display an in-group bias. Participants perceiving themselves as non-overweight showed more pronounced anti-fat bias compared to participants in the non-death threat condition. In contrast, participants perceiving themselves as overweight demonstrated less anti-fat bias than respective controls.

Keywords: anti-fat bias, social identity, terror management theory, mortality salience, overweight

The Heavy Weight of Death: How Anti-Fat Bias is Affected by Weight-Based Group Membership and Existential Threat

In comparison to thin people, the group of overweight people is judged in a very negative manner (e.g., Crandall, 1994; so called anti-fat bias). While being thin is associated with positive attributes, fat people are thought to be less happy, to have lower social status, and to be less attractive (e.g., Ahern & Hetherington, 2006). Somewhat surprisingly, previous research revealed that not only thin but also overweight evaluators show anti-fat bias (e.g., Davison & Birch, 2004). According to Social Identity Theory (SIT; Tajfel & Turner, 1979), low in-group identification might account for the missing in-group bias in overweight evaluators. However, Terror Management Theory (TMT; Greenberg, Pyszczynski, & Solomon, 1986) suggests existential threat to increase in-group identification (e.g., Castano, Yzerbyt, Paladino, & Sacchi, 2002; Fritsche, Jonas, & Fankhänel, 2008). Therefore, by merging insights from research on anti-fat bias, SIT, and TMT, the aim of the present work is to investigate the idea that existential threat differentially affects the expression of anti-fat bias depending on evaluators' respective self-perceived membership in either the group of overweight or non-overweight people.

Anti-Fat Bias & In-Group Devaluation

In western societies, overweight people are stereotypically negatively evaluated. Especially obese women (Crandall & Biernat, 1990) are thought to be unattractive, weak willed, asexual, morally and emotionally impaired, and unlikable (Agel & Rothblum, 1991; Allison, Basile, & Yuker, 1991; Cramer & Steinwert, 1998; Crandall, 1994; Drury & Louis, 2002; Goldenberg, Arndt, Hart, & Brown, 2005; Harris, Harris, & Bochner, 1982; Harris, Walters, & Waschull, 1991; Maddox, Back, & Liederman, 1968; Schupp & Renner, 2011) resulting in massive consequences. First of all, overweight individuals tend to judge themselves in a negative manner (Crandall & Biernat, 1990; Maddox et al., 1968) and to be

dissatisfied with their own bodies (Ahern & Hetherington, 2006) which can lead to dieting (Cramer & Steinwert, 1998) and eating disorders (Ahern & Hetherington, 2006; Davison & Birch, 2004; Goldenberg et al., 2005). Furthermore, overweight people are treated disadvantageously by others: Overweight people are less likely to be chosen for romantic/intimate relationships (Tiggemann & Rothblum, 1988) and are discriminated in the workplace (Puhl & Brownell, 2001). Even worse, overweight people are not only stigmatized and discriminated by laypersons but also by doctors, nurses, or fitness professionals (Robertson & Vohora, 2008; Schwartz, O'Neal Chambliss, Brownell, Blair, & Billington, 2003; Teachman & Brownell, 2001).

Several studies addressed the relationship between evaluators' own body weight and the strength of anti-fat bias showing that overweight people devaluate overweight others to the same degree non-overweight individuals do (Davison & Birch, 2004; Harris et al., 1991; Rudman, Feinberg, & Fairchild, 2002; Wang, Brownell, & Wadden, 2004). According to SIT (Tajfel & Turner, 1979) such in-group devaluation could be explained by low in-group identification (e.g., Castano & Yzerbyt, 1998): SIT posits that individuals' self-concepts are partially based on the individuals' knowledge that she or he belongs to a social group and that membership in this social group is associated with certain values and emotional significance. If a person values her/his social in-group as positive (e.g., because of high status) that person derives a positive social identity from group membership (e.g., Jetten, Spears, & Manstead, 1996). However, according to the fat-is-bad stereotype (e.g., Crandall, 1994), social identity based on the membership in the group of overweight people is negatively co notated and, thus, overweight individuals strongly strive to leave their in-group by dieting and losing weight. As a consequence, (high) in-group identification is unlikely for individuals who perceive themselves as overweight (see also Rudman et al., 2002) leading to in-group devaluation mirrored by anti-fat bias in overweight evaluators.

Terror Management Theory & In-Group Bias

However, by referring to research on TMT (Castano et al., 2002) we suggest that existential threat might enhance in-group identification not only for non-overweight but also for overweight evaluators resulting in a deviating expression of anti-fat bias. TMT is concerned with the consequences that the threat of death has on human cognition and behavior (Greenberg et al., 1986). In relation to death, humans' ability to think in an abstract and self-reflected manner leads people into a difficult situation: On the one hand, because of their cognitive abilities, humans know that they will have to die eventually. Additionally, one cannot know for sure when or how one will die. On the other hand and as all living organisms, humans strive toward self-preservation and survival (Harmon-Jones, Greenberg, Solomon, & Simon, 1996). TMT posits that awareness of the inevitability of mortality creates a potential for terror (Greenberg, Solomon, & Pyszczynski, 1997) and that cultural worldviews offer a means to maintaining psychological equanimity and controlling this terror by making people believe that they are valuable beings in a meaningful, orderly conception of reality that contains a set of standards and values. By living up to those standards, people believe that they are valuable beings in this meaningful reality. Correspondingly, reminding people of their mortality should lead them to increase their defenses and bolster their cultural worldview, resulting in derogating those who violate important cultural standards and supporting those who uphold them.

Empirical evidence demonstrates existential threat to enhance in-group favoritism (e.g., Harmon-Jones et al., 1996; Jonas, Schimel, Greenberg, & Pyszczynski, 2002) and out-group derogation (e.g., Fritsche et al., 2008; Greenberg et al., 1990; Rosenblatt, Greenberg, Solomon, Pyszczynski, & Lyon, 1989). For example, Greenberg et al. (1990) showed that under existential threat in-group members (Christians) evaluated out-group members (Jews) more negatively in comparison to in-group members. Looking for the underlying processes,

Castano et al. (2002) were able to show that existential threat increases in-group identification leading to an enhanced in-group bias.

Why should higher group identification buffer anxiety resulting from existential threat? First of all, enhanced in-group identification could be an attempt to preserve cultural worldview as group membership provides the source and validation of cultural worldviews (Fritsche et al., 2008). Second, the resulting enhanced in-group bias could serve an anxiety buffering function by an increase of self-esteem (Baldwin & Wesley, 1996; Mikulincer & Florian, 2002). As mentioned above, SIT (Tajfel & Turner, 1979) assumes individuals to derive their self-esteem at least partly from social identity. Humans feel good about themselves if their social group is perceived as having more positive value than the respective out-group (Sherman, Hamilton, & Lewis, 1999). Therefore, a useful strategy to increase self-esteem may be in-group favoritism and out-group derogation (Abrams & Hogg, 1988; Branscombe & Wann, 1994; see also Baldwin & Wesley, 1996). Third, the link between individuals and their in-group could be an anxiety buffer per se (Castano et al., 2002): TMT assumes people to cope with existential threat also by striving for a symbolic afterlife (Greenberg et al., 1997). Social identity based on group membership might provide for such afterlife: Group membership is highly symbolic because the social group does live on after the individuals' death. Thus, group membership provides a possibility for individuals to distance themselves from the parts of their personal identity that are going to die and to identify with an entity (i.e. the social group) that is longer lasting than the personal self. In this perspective, upgrading in-group membership by in-group favoritism and out-group derogation is functional to increase the capacity of one's own social in-group to ensure afterlife.

The Present Research

Merging the research on anti-fat bias, SIT, and TMT, we assume identification with either the group of overweight or non-overweight people to be a crucial factor for weight-based evaluations of others especially under existential threat. As in-group identification is influenced by existential threat (Castano et al., 2002), we suggest individuals under mortality salience (MS) to demonstrate weight-based in-group bias. Therefore, evaluators associating themselves with the group "non-overweight people" should increase identification with that group mirrored by an enhanced positive evaluation of non-overweight people (i.e. in-group favoritism) as well as an enhanced negative evaluation of overweight people (i.e. out-group derogation) in comparison to respective evaluators who are not exposed to MS. This should result in a higher degree of anti-fat bias (H1). In contrast, evaluators associating themselves with the in-group "overweight people" should increase identification with that group and are expected to more positively evaluate overweight people (i.e. in-group favoritism) and to devaluate non-overweight people (i.e. out-group derogation) in comparison to respective evaluators who are not expose to MS. This should result in a lower degree of anti-fat bias (H2).

Method

Subjects and Design

A total of 101 female students of the University of Mannheim (M_{age} = 21.28 years, *SD* = 2.39, range 18–29 years) participated in a study labeled „Self-evaluation and judgment of other people" for a reimbursement of 4 € or in partial fulfillment of departmental requirements. The experiment lasted about 20 minutes. Participants were randomly assigned to the experimental conditions in a 2 (Salience Condition: MS vs. dental pain) x 2 (Stimulus Person: overweight vs. non-overweight) between-subjects factorial design, plus the measured perceived weight-based group membership.

Materials and Procedure

After giving written informed consent, participants were seated in front of a laptop and randomly assigned to the experimental conditions. First, participants received the MS or the dental pain control treatment. The MS condition consisted of two open-ended short-answer questions: "Briefly describe the feelings that the thought of your own death arouses in you." and "Please describe in as much detail as possible what you think will happen as you die and once you are physically dead." Those two questions have been successfully used before to manipulate MS (e.g., Greenberg et al., 1990, 1997; Schimel et al., 1999). Participants in the control condition answered the same two questions, but in relation to dental pain without any mentioning of dying or death. This dental pain treatment has been successfully used before as a control treatment to ensure that people are thinking about a potentially painful situation (e.g., Fritsche et al., 2008). To ensure unconscious processing of these explicit primes, all participants next answered 60 items of the German translation of the extended version of the Positive and Negative Affect Schedule (PANAS-X; Röcke & Grühn, 2003; Watson, Clark, & Tellegen, 1988). This approach leads to a timely delay and is used to ensure that participants switch from consciously to subconsciously processing of death-related (vs. dental pain-related) thoughts. It has successfully served this purpose in former studies on terror management (e.g., Greenberg et al., 1997; Schimel et al., 1999). This self-report inventory asks participants to rate the extent to which they are currently experiencing a number of different feelings. Ratings are made using 5-point scales ranging from 1 (not at all applicable) to 5 (extremely applicable).

In a second step, participants were asked to evaluate a schematic drawing of either a non-overweight or an overweight female person based on the Body Image Assessment Scale (Thompson & Gray, 1995). The original scale includes nine female and nine male schematic body drawings. As Thompson and Gray showed, 90.2 % of their participants rated the

overweight female person as “obese” and as distinct from the non-overweight female person. Base on previous research (e.g., Crandall, 1994; Harris et al., 1982; Puhl, Schwartz, & Brownell, 2005), stimulus material was evaluated on 16 items ($\alpha = .94$), such as: not attractive to attractive, weak-willed to strong-willed, and to have low socio-economic status to high economic status. Evaluation score was calculated by averaging individual ratings on the 16 items, with a low score indicating a negative evaluation of the stimulus person.

In order to assess whether indidividuals’ rather associate themselves with the in-group of overweight than non-overweight, Perceived Body Weight was assessed using the German items of the subscales Drive for Thinness and Body Dissatisfaction of the EDI-2 (Paul & Thiel, 2005). Drive for Thinness (seven items) assesses participants’ occupation with dieting, weight, and anxiety to gain weight (e.g., “I think about dieting”). Individuals scoring high on these items are assumed to be afraid to be overweight and, thus, intensively strive to lose weight in order to be thinner. Furthermore, Body Dissatisfaction (nine items) measures participants’ satisfaction regarding own body shape and size of certain body parts (e.g., “I believe that my belly is too big.”). Thus, people strongly driving to be thin and with high body dissatisfaction are more likely to associate themselves with the in-group of overweight people. In contrast, participants with low drive to be thin and with high body satisfaction more likely associate themselves with the in-group of non-overweight people. All 16 items ($\alpha = .92$) had to be rated on a 6-point scale ranging from never (1) to always (6). Perceived Body Weight score was calculated by averaging all ratings, with higher scores indicating stronger association with the group of over-weight people.

In a final step, participants answered demographic items (age, gender, subject of studies, first language, and height). Also, participants were weighted using a digital electronic scale. Four participants decided to weight themselves and to report their weight

anonymously on a separate sheet of paper.[1] At the end, participants were thanked for participation and fully debriefed.

Results

In a first step, two one-way ANOVAs were calculated with Salience Condition as factor and positive ($\alpha = .88$) and negative ($\alpha = .91$) affect scores of the PANAS-X as dependent variables, respectively, showing that MS had no effect on participants' mood, both *p*s > .20. This is consistent with prior research on TMT (Greenberg et al., 1997).

According to our hypotheses, individuals associating themselves with the in-group "non-overweight people" were expected to enhance the positive evaluation of non-overweight people as well as the negative evaluation of overweight people in comparison to respective individuals who are not exposed to MS (i.e. to demonstrate more pronounced anti-fat bias; H1). In contrast, individuals associating themselves with the in-group "overweight people" were expected to devaluate non-overweight people and to more positively evaluate overweight people in comparison to respective individuals who are not expose to MS (i.e., to demonstrate less pronounced anti-fat bias; H2). Thus, a significant coefficient was expected for the three-way interaction of Stimulus Person × Perceived Body Weight × Salience Condition.

To test moderation when one of the predictors is continuous, analyses were conducted using hierarchical regression (Aiken & West, 1991; Dawson & Richter, 2006). All variables were mean centered to reduce multicollinearity and to facilitate interpretation of lower order effects (Aiken & West, 1991; Irwin & McClelland, 2001). In a first step, main effects for Stimulus Person (coded "–1" for non-overweight and "+1" for overweight), Perceived Body Weight (standardized), Salience Condition (coded "–1" for dental pain and "+1" for MS), the two-way interaction terms (Stimulus Person × Perceived Body Weight; Stimulus Person × Salience Condition; Perceived Body Weight × Salience Condition) as well as the three-way

interaction term (Stimulus Person × Perceived Body Weight × Salience Condition) were used to predict the evaluation of the stimulus person.[2]

The results of the regression analysis can be seen in Table 1. *R* for the entire regression model was significantly different from zero, $F(7, 93) = 27.56$, $p < 01$. Altogether, 67.5% (65% adjusted) of the variability of evaluation score was explained by the predictors and their interactions. Results on the evaluation of the stimulus person showed a significant main effect of Stimulus Person, $\beta = -.82$, $t(93) = -13.42$, $p < .01$. As expected, the overweight stimulus person was rated more negatively than the non-overweight one. Moreover, a significant two-way interaction between Stimulus Person and Perceived Body Weight occurred, $\beta = -.14$, $t(93) = -2.18$, $p = .03$, which, however, was qualified by the predicted three-way interaction, $\beta = .16$, $t(93) = 2.58$, $p = .01$. To facilitate interpretation and exposition of the interaction, simple slopes analyses were conducted (Aiken & West, 1991; Dawson & Richter, 2006).

Regression lines were plotted for one standard deviation above and below the mean for Perceived Body Weight (cf. Aiken & West, 1991). As Table 2 shows, examining participants who perceived themselves as non-overweight (i.e., reporting low levels of Perceived Body Weight), the slope of the relationship between Stimulus Person and evaluation score was significantly more pronounced (i.e., demonstrating a higher degree of anti-fat bias, H1) for participants in den MS condition compared to the dental pain condition, $\beta = -.23$, $t = 1.95$, $p = .05$. According to Figure 1, the main reason for this effect is that, compared to dental pain condition, the overweight stimulus person was devaluated even more under MS. In contrast, for participants who perceived themselves as overweight (i.e., reporting high levels of Perceived Body Weight), the slope of the relationship between Stimulus Person and evaluation score was marginal significantly less pronounced (i.e., demonstrating a lower degree of anti-fat bias, H2) for participants in den MS condition

compared to the dental pain condition, $\beta = .22$, $t = 1.74$, $p = .09$. According to Figure 2, compared to dental pain condition, MS decreased positive evaluation of the non-overweight stimulus person whereas positive evaluation of the overweight stimulus person was enhanced under MS.

Discussion

Previous empirical findings on anti-fat bias showed that people tend to devaluate overweight individuals (e.g., Crandall, 1994). However, based on research on SIT and TMT (Castano et al., 2002), we assumed in-group membership to be a crucial factor for weight-based evaluations of others when being confronted with existential threat. Thus, the present study aimed at investigating two hypotheses that were derived by merging research insights on anti-fat bias, intergroup relations and TMT. Specifically, we expected individuals to demonstrate weight-based in-group bias when confronted with existential threat: Individuals associating themselves with the in-group of non-overweight people were expected to exhibit even higher levels of anti-fat bias than respective controls. In contrast, individuals associating themselves with the in-group of overweight people were expected to show less anti-fat bias than respective individuals of the control condition. Results strongly support our hypotheses by showing that the degree of anti-fat bias varied as a function of evaluators' self-perceived in-group membership when confronted with existential threat: While individuals who associated themselves with the group of non-overweight people demonstrated even more pronounced anti-fat bias, individuals associating themselves with the group of overweight people show diminished anti-fat bias. Those effects are driven by in-group favoritism and out-group derogation.

We interpret those results according to previous findings on TMT and interpersonal relations (e.g., Castano et al., 2002; Greenberg et al., 1990). The findings of the present study are especially consistent with the assumption that in-group membership might serve an

anxiety buffering function per se. Threatened by death and the annihilation of the personal self, enhancement of in-group identification might be the best way to ensure symbolic afterlife through the social self that is contained in social group membership. If individuals are reminded of their own mortality, ensuring themselves that they will live on through their social group will help them deal with death anxiety. Higher identification with a particular social group helps individuals to shift from personal to social identity when existentially threatened (see also Castano et al., 2002). However, as enhanced in-group identification also leads to increased in-group favoritism and out-group derogation, there might also be an additional self-esteem enhancing mechanism involved further buffering death anxiety.

In the present study, participants' association with their respective weight based in-group was assumed to be based on self-perceived body size and weight: Participants, who were satisfied with their own body and who reported low drive for thinness, were assumed to identify with the in-group of non-overweight people while participants who were dissatisfied with their own body image were assumed to identify with the in-group of overweight people. As reasonable as these assumptions might be, future research should find ways to assess this assumed association more directly, for example by explicitly asking participants which weight based in-group they actually identify with. Furthermore, in this research, anti-fat bias was measured by participants' self-reports. However, such measurement is vulnerable to response biases (e.g., social desirability; Ahern & Hetherington, 2006; Schwartz, Vartanian, Nosek, & Brownell, 2006). Thus, future research should use methods to assess implicit attitudes toward overweight, for instance IAT or neuroscientific methods. Finally, notice that only a schematic body drawing of a female but not of a male person was used because female obese individuals seem to be stigmatized in a much stronger way than male obese people (Crandall & Biernat, 1990). Therefore, anti-fat bias was assumed to show especially for a female schematic drawing. Accordingly, gender of the study's participants was matched

accordingly in order to avoid any confounding effects based on evaluations of the opposite sex. Future research should provide evidence that the effect also holds for male individuals if male stimulus persons have to be evaluated.

Anti-fat bias is known to lead to discrimination (Puhl & Brownell, 2001) and stigmatization of overweight people by laypersons as well as health professionals (Robertson & Vohora, 2008; Schwartz et al., 2003; Teachman & Brownell, 2001). The present results demonstrate existential threat to increase anti-fat bias for some evaluators, which might lead to even stronger discrimination and stigmatization of overweight individuals in situations when death threats are salient. For example, in the context of medical emergency situations especially non-overweight health professionals might be negatively influenced by the overweight of a patient and make false diagnoses further harming the patient (see, Young & Powell, 1985).

In sum, by merging the research on anti-fat bias, SIT, and TMT, the present work provides first evidence that the expression of anti-fat bias is, especially under existential threat, influenced by the evaluators' identification with either the group of overweight or non-overweight people.

References

Abrams, D., & Hogg, M. A. (1988). Comments on the motivational status of self-esteem in social identity and intergroup discrimination. *European Journal of Social Psychology, 18,* 317–334. doi 10.1002/ejsp.2420180403

Ahern, A. L., & Hetherington, M. M. (2006). The thin ideal and body image: An experimental study of implicit attitudes. *Psychology of Addictive Behaviors, 20*, 338–342. doi 10.1037/0893-164X.20.3.338

Agell, G., & Rothblum, E D. (1991). Effects of clients' obesity and gender on the therapy judgments of psychologists. *Professional Psychology: Theory and Practice, 22,* 223–229. doi 10.1037/0735-7028.22.3.223

Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions.* Thousand Oaks, CA: Sage.

Allison, D. B., Basile, V. C., & Yuker, H. E. (1991). The measurement of attitudes toward and beliefs about obese persons. *International Journal of Eating Disorders, 10,* 599–607. doi 10.1002/1098-108X(199109)10:5<599::AID-EAT2260100512>3.0.CO;2-#

Baldwin, M. W., & Wesley, R. (1996). Effects of existential anxiety and self-esteem on the perception of others. *Basic and Applied Social Psychology, 18,* 75–95. doi 10.1207/s15324834basp1801_7

Branscombe, N. R., & Wann, D. L. (1994). Collective self-esteem consequences of outgroup derogation when a valued social identity is on trial. *European Journal of Social Psychology, 24,* 641–657. doi 10.1002/ejsp.2420240603

Castano, E., & Yzerbyt, V. Y. (1998). The highs and lows of group homogeneity. *Behavioural Processes, 42,* 219–238. doi 10.1016/S0376-6357(97)00078-8

Castano, E., Yzerbyt, V. Y., Paladino, M.-P., & Sacchi, S. (2002). I belong therefore I exist: Ingroup identification, ingroup entitativity, and ingroup bias. *Personality and Social Psychology Bulletin, 28,* 135–143. doi 10.1177/0146167202282001

Cramer, P., & Steinwert, T. (1998). Thin is good, fat is bad: How early does it begin? *Journal of Applied Developmental Psychology, 19*, 429–451. doi 10.1016/S0193-3973(99)80049-5

Crandall, C. S. (1994). Prejudice against fat people: Ideology and self-interest. *Journal of Personality and Social Psychology, 66*, 882–894. doi 10.1037/0022-3514.66.5.882

Crandall, C. S., & Biernat, M. (1990). The ideology of anti-fat attitudes. *Journal of Applied Social Psychology, 20,* 227–243. doi 10.1111/j.1559-1816.1990.tb00408.x

Davison, K. K., & Birch, L. L. (2004). Predictors of fat stereotypes among 9-year-old girls and their parents. *Obesity Research, 12,* 86–94. doi 10.1038/oby.2004.12

Dawson, J. F., & Richter, A. W. (2006). Probing three-way interactions in moderated multiple regression: Development and application of a slope difference test. *Journal of Applied Psychology, 91,* 917–926. doi 10.1037/0021-9010.91.4.917

Drury, C. A. A., & Louis, M. (2002). Exploring the association between body weight, stigma of obesity, and health care avoidance. *Journal of the American Academy of Nurse Practitioners, 14,* 554–561. doi 10.1111/j.1745-7599.2002.tb00089.x

Fritsche, I., Jonas, E., & Fankhänel, T. (2008). The role of control motivation in mortality salience effects on ingroup support and defense. *Journal of Personality and Social Psychology, 95,* 524–541. doi 10.1037/a0012666

Goldenberg, J. L., Arndt, J., Hart, J., & Brown, M. (2005). Dying to be thin: The effects of mortality salience and body mass index on restricted eating among women. *Personality and Social Psychology Bulletin, 31*, 1400–1412. doi 10.1177/0146167205277207

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.

Greenberg, J., Solomon, S., & Pyszczynski, T. (1997). Terror management theory of self-esteem and cultural world-views: Empirical assessment and conceptual refinements. In M. P. Zanna (ed.), *Advances in Experimental Psychology* (Vol. 29, pp. 61–139). New York: Academic Press.

Greenberg, J., Solomon, S., Veeder, M., Pyszczynski, T., Rosenblatt, A., Kirkland, S., & Lyon, D. (1990). Evidence for terror management theory II: The effects of mortality salience on reactions to those who threaten or bolster the cultural world view. *Journal of Personality and Social Psychology, 58,* 308–318. doi 10.1037/0022-3514.58.2.308

Harmon-Jones, E., Greenberg, J., Solomon, S., & Simon, L. (1996). The effects of mortality salience on intergroup bias between minimal groups. *European Journal of Social Psychology, 26,* 677–681. doi 10.1002/(SICI)1099-0992(199607)26:4<677::AID-EJSP777>3.0.CO;2-2

Harris, M. B., Harris, R. J., & Bochner, S. (1982). Fat, four-eyed, and female: Stereotypes of obesity, glasses and gender. *Journal of Applied Social Psychology, 12,* 503–516. doi 10.1111/j.1559-1816.1982.tb00882.x

Harris, M. B., Walters, L. C., & Waschull, S. (1991). Gender and ethnic differences in obesity-related behaviors and attitudes in a college sample. *Journal of Applied Social Psychology, 21,* 1545–1566. doi 10.1111/j.1559-1816.1991.tb00487.x

Irwin, J. R., & McClelland, G. H. (2001). Misleading heuristics for moderated multiple regression models. *Journal of Marketing Research*, *38*, 100–109.

Jetten, J., Spears, R., & Manstead, A. S. R. (1996). Intergroup norms and intergroup discrimination: Distinctive self-categorization and social identity effects. *Journal of Personality and Social Psychology, 71,* 1222–1233. doi 10.1037/0022-3514.71.6.1222

Jonas, E., Schimel, J., Greenberg, J., & Pyszczynski, T. (2002). The scrooge effect: Evidence that mortality salience increases prosocial attitudes and behavior. *Personality and Social Psychology Bulletin, 28,* 1342–1353. doi 10.1177/014616702236834

Maddox, G. L, Back, K. W., & Liederman, V. R. (1968). Overweight as social deviance and disability. *Journal of Health and Social Behavior, 9,* 287–298.

Mikulincer, M., & Florian, V. (2002). The effect of mortality salience on self-serving attributions – Evidence for the function of self-esteem as a terror management mechanism. *Basic and Applied Social Psychology, 24,* 261–271. doi 10.1207/S15324834BASP2404_2

Paul, T., & Thiel, A. (2005). *Eating Disorder Inventory-2: Deutsche Version*. Göttingen: Hogrefe Verlag.

Puhl, R., & Brownell, K. D. (2001). Bias, discrimination, and obesity. *Obesity research, 9,* 788–805. doi 10.1038/oby.2001.108

Puhl, R. M., Schwartz, M. B., & Brownell, K. D. (2005). Impact of perceived consensus on stereotypes about obese people: A new approach for reducing bias. *Health Psychology, 24,* 517–525. doi 10.1037/0278-6133.24.5.517

Robertson, N., & Vohora, R. (2008). Fitness vs. fatness: Implicit bias towards obesity among fitness professionals and regular exercisers. *Psychology of Sport and Exercise, 9,* 547–557. doi 10.1016/j.psychsport.2007.06.002

Röcke, C., & Grühn, D. (2003). German translation of the PANAS-X. Unpublished manuscript, Free University Berlin. Retrieved from http://www4.ncsu.edu/~dgruehn/page7/page10/files/panas-x-german.pdf

Rosenblatt, A., Greenberg, J., Solomon, S., Pyszczynski, T., & Lyon, D. (1989). Evidence for terror management theory: I. The effects of mortality salience on reactions to those who violate or uphold cultural values. *Journal of Personality and Social Psychology, 57,* 681–690. doi 10.1037/0022-3514.57.4.681

Rudman, L. A., Feinberg, J., & Fairchild, K. (2002). Minority members' implicit attitudes: Automatic in-group bias as a function of group status. *Social Cognition, 20,* 294–320. doi 10.1521/soco.20.4.294.19908

Schimel, J., Simon, L., Greenberg, J., Pyszczynski, T., Solomon, S., Waxmonsky, J., & Arndt, J. (1999). Stereotypes and terror management: Evidence that mortality salience enhances stereotypic thinking and preferences. *Journal of Personality and Social Psychology, 77,* 905–926. doi 10.1037/0022-3514.77.5.905

Schupp, H. T., & Renner, B. (2011). The implicit nature of the anti-fat bias. *Frontiers in Human Neurosciences, 5*, 1–11. doi 10.3389/fnhum.2011.00023

Schwartz, M. B., O'Neal Chambliss, H., Brownell, K. D., Blair, S. N., & Billington, C. (2003). Weight bias among health professionals specializing in obesity. *Obesity Research, 11,* 1033–1039. doi 10.1038/oby.2003.142

Schwartz, M. B., Vartanian, L. R., Nosek, B. A., & Brownell, K. D. (2006). The influence on one's own body weight on implicit and explicit anti-fat bias. *Obesity, 14,* 440–447. doi 10.1038/oby.2006.58

Sherman, S. J., Hamilton, D. L., & Lewis, A. C. (1999). Perceived entitativity and the social identity value of group memberships. In D. Abrahams & M. A. Hogg (eds.), *Social identity and social cognition* (pp. 80–110). Cambridge, MA: Blackwell.

Tajfel, H., & Turner, J. (1979). An integrative theory of intergroup conflict. In W. G. Austin & S. Worchel (eds.), *Psychology of intergroup relations* (pp. 33–48). Monterey, CA: Brooks-Cole.

Teachman, B. A., & Brownell, K. D. (2001). Implicit anti-fat bias among health professionals: Is anyone immune? *International Journal of Obesity & Related Metabolic Disorders, 25,* 1525–1531.

Thompson, M. A., & Gray, J. J. (1995). Development and validation of a new body-image assessment scale. *Journal of Personality Assessment, 64*, 258–269.

Tiggemann, M., & Rothblum, E. D. (1988). Gender differences in social consequences of perceived overweight in the United States and Australia. *Sex Roles, 18,* 75–86. doi 10.1007/BF00288018

Wang, S. S., Brownell, K. D., & Wadden, T. A. (2004). The influence of the stigma of obesity on overweight individuals. *International Journal of Obesity, 28,* 1333–1337. doi 10.1038/sj.ijo.0802730

Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS Scales. *Journal of Personality and Social Psychology, 54,* 1063–1070. doi 10.1037/0022-3514.54.6.1063

Young, L. M., & Powell, B. (1985). The effects of obesity on the clinical judgments of mental health professionals. *Journal of Health and Social Behavior, 26,* 233–246.

Footnotes

[1] BMI as a predictor was calculated by dividing each participants body weight by the square of her height (M_{height} = 168 cm, SD = 6.11; M_{weight} =62.85 kg, SD = 9.83). As participants were weighted fully clothed, for all participants one kilogram was subtracted from the initially measured body weight in order to account for clothing. Linear regression analyses did not yield a significant three-way interaction of Salience Condition × Stimulus Person × BMI, $t(93) = –0.37$, $p = .97$ in predicting attitude score. Thus, BMI was not further investigated as a predictor.

[2] Perceived Body Weight-scores revealed to be independent of the predictors Stimulus Person, $t = 0.83$, $p = .41$, and Salience Condition, $t = 1.55$, $p = .13$, as well as the interaction of both predictors, $t = –0.61$, $p = .67$.

Table 1

Summary of regression analysis for variables predicting evaluation score (N = 101)

Variable	*b*	*SE*	*b**	*t*	*p*
SC	–0.09	.17	–.06	–1.03	.307
SP	–1.14	.17	–.82	–13.42	< .001
PBW	–0.03	.09	–.02	0.37	.701
SC × SP	–0.00	.34	.00	–0.05	.961
SP × PBW	–0.19	.17	–.14	–2.18	.032
SC × PBW	0.09	.17	.03	0.54	.593
SC × SP × PBW	0.89	.35	.16	2.58	.012

Note. SC – Salience Condition; SP – Stimulus Person; PBW – standardized perceived body weight. Displayed are the unstandardized regression coefficients (*b*), the standard errors (*SE*), the standardized regression coefficients (b^*), the *t*-values, and respective significance values (*p*).

Table 2

Summary of the slope difference tests for the variable stimulus person predicting evaluation score under the moderating effects of Salience Condition (SC) and Perceived Body Weight (PBW), (N = 101)

Slope pair	*b*	*SE*	*df*	*t*	*p*
Low PBW					
SC_{dental}	–.73	.16	93	–4.45	< .001
$SC_{mortality}$	–1.18	.17	93	–7.12	< .001
Slope difference	–.23	.12	93	–1.95	.054
High PBW					
SC_{dental}	–1.55	.21	93	–7.57	< .001
$SC_{mortality}$	–1.11	.15	93	–7.58	< .001
Slope difference	.22	.13	93	1.74	.086

Note. Displayed are unstandardized regression coefficients (*b*), the standard errors (*SE*), degrees of freedom (*df*), the *t*-values, and respective significance values (*p*).

Figure 1. Evaluation Score as a Function of Stimulus Person and Salience Condition for Participants Associating With Non-Overweight In-Group (Low Levels of Perceived Body Weight).

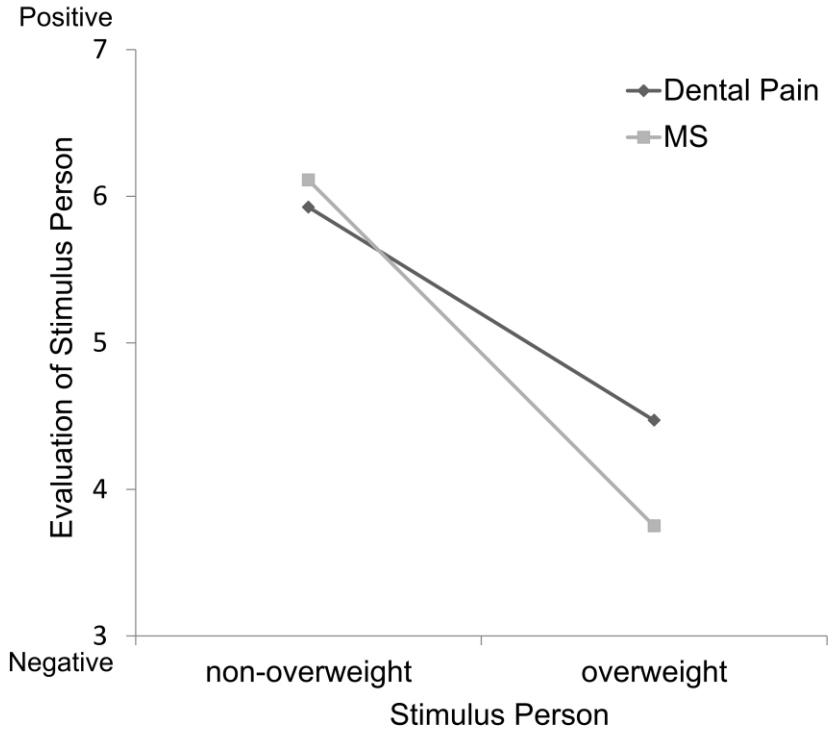
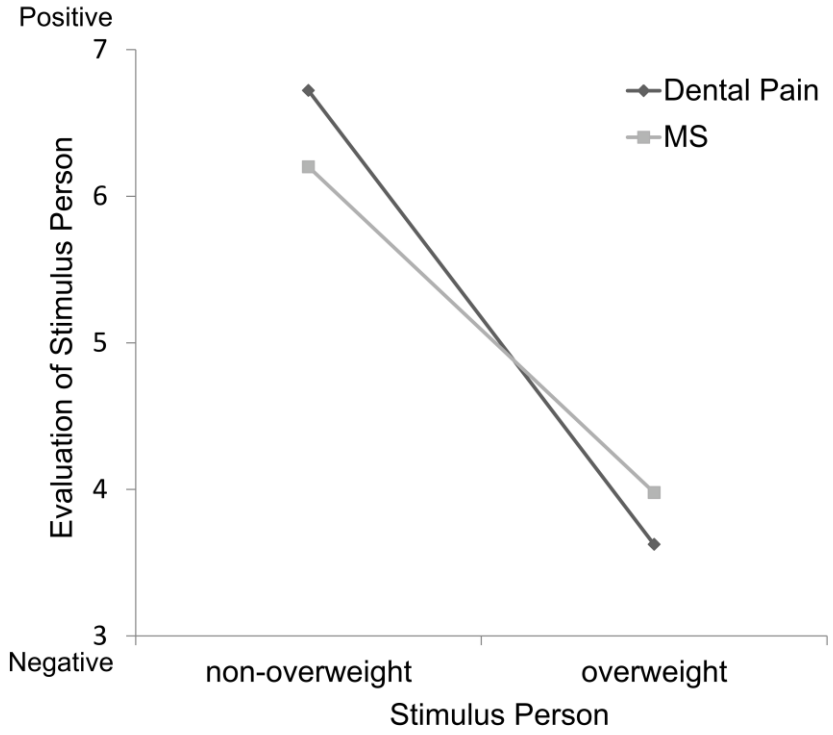


Figure 2. Evaluation Score as a Function of Stimulus Person and Salience Condition for Participants Associating With Overweight In-Group (High Levels of Perceived Body Weight).



APPENDIX B

Pfattheicher, S., & Schindler, S. (2014). *Understanding the evil side of costly punishment: When everyday sadists punish cooperative others facing existential threat.* Manuscript submitted for publication.

Understanding the Dark Side of Costly Punishment:
When Everyday Sadists Punish Cooperative Others Facing Existential Threat

Stefan Pfattheicher[1] & Simon Schindler[2]
[1] Ulm University, Germany; [2] Kassel University, Germany

Stefan Pfattheicher is a lecturer at the Department of Social Psychology at Ulm University, Germany. His research interests include the understanding of how motivational orientations and endocrinological factors shape behavior in social dilemma situations.
Simon Schindler works as an academic assistant at the Institute of Psychology at Kassel University, Germany. His research interests include: terror management, social norms, deception detection, and social identity.

Corresponding author:
Stefan Pfattheicher
Universität Ulm
Abteilung Sozialpsychologie
89069 Ulm, Germany
stefan.pfattheicher@uni-ulm.de

The authors declared no potential conflicts of interests with respect to the authorship and/or publication of this article. The authors received no financial support for the research and/or authorship of this article.

Word count: 5.784

Abstract

So far, little is known about a specific destructive behavior in social dilemma situations that reliably emerges when individuals face the possibility of punishing others: antisocial punishment, that is, costly punishing *cooperative* individuals. We argue that antisocial punishment reflects the basic characteristics of sadism, namely, aggressive behavior to dominate and to harm other individuals. We further argue that antisocial punishment may reflect a type of behavior that allows for the maintenance of self-esteem (through aggressively dominating others). Therefore, we expect that individuals who report a disposition for everyday sadism are particularly likely to engage in antisocial punishment when their self has been threatened (by thinking about one's own death). In a study ($N = 99$), we found empirical support for this assumption. The present research contributes to a better understanding of antisocial punishment and suggests that sadistic tendencies play a crucial role, especially when the self is (existentially) threatened.

Word count: 149

Keywords: antisocial punishment; dominance; mortality salience; sadism; social dilemma

INTRODUCTION

Humans can be extraordinarily evil (Miller, 2004). Indeed, the appearance of evil behavior is manifold, it varies from mass-killings by the brutal Nazi-regime to murder of single others and domestic violence (Baumeister & Campbell, 1999; Bushman & Huesmann, 2010). The present research examines one specific evil behavior that emerges in social dilemma situations: antisocial punishment, that is, using one's own resources to costly punish *cooperative* individuals.

In social dilemma situations, individuals are better off when they behave uncooperatively rather than cooperatively (cf. van Lange, Balliet, Parks, & van Vugt, 2014; van Lange, Joireman, Parks, & van Dijk, 2013). For instance, during a drought, farmers can overuse water to save their own harvest (cf. Ostrom, 1990). The problem with this is that saving one's own harvest by overusing water damages the harvests of other farmers. Thus, the problem (i.e., the dilemma) is that an individual benefits from uncooperative behavior that results, however, in a reduced benefit for the collective. This problem is inherent in social dilemma situations and ultimately results in the question of how uncooperative behavior can be avoided. One prominent solution in this regard is to establish a system of costly punishment, that is, the option to invest private resources to punish interaction partners (Fehr & Gächter, 2002). In fact, a remarkable amount of empirical evidence (cf. the meta-analysis of Balliet, Mulder, & van Lange, 2011) has convincingly shown that (a) punishing uncooperative others leads to an increase in cooperative behavior of the punished individuals in future interactions, and (b) there is a higher cooperation level in situations in which an option to punish is available as compared with situations in which no such option is available. Interestingly, in such situations it is not only uncooperative individuals that are punished but also cooperative individuals (i.e., antisocial punishment; Herrmann, Thöni, & Gächter, 2008).

Although antisocial punishment reliably emerges across societies (Herrmann et al., 2008) it can be seen when reviewing the literature on antisocial punishment that only a few empirical papers have investigated this interesting behavioral phenomenon (cf. Sylwester, Herrmann, &

Bryson, 2013). That is, the investigation of antisocial punishment has been almost completely neglected in social dilemma research thus far (cf. Dreber & Rand, 2012; Herrmann et al., 2008). Published empirical papers mainly focus on the boundary conditions of antisocial punishment. For instance, Herrmann et al. (2008) showed that antisocial punishment is more likely to emerge in societies with relatively weak norms of civic cooperation and an established and functioning judiciary (see also Gächter & Herrmann, 2009). Bernhard, Fischbacher, and Fehr (2006) document (on a descriptive level) that antisocial punishment is more likely to emerge when an outgroup member (as compared with an ingroup member) can be punished (for similar findings see Goette, Huffman, Meier, & Sutter, 2012).

An investigation that examines psychological factors of antisocial punishment is almost completely lacking. One exception is the work by Pfattheicher, Landhäußer, and Keller (in press) who argued that antisocial punishment reflects aggressive behavior to dominate and to harm other individuals (see also Sylwester et al., 2013, who made the same argument). Accordingly, Pfattheicher and colleagues (in press) showed that antisocial punishment could be predicted by aggressive dominance concerns and the dominance-related hormone testosterone given a relatively low level of cortisol (i.e., the dual hormone hypothesis; Carré & Mehta, 2011; Mehta & Josephs, 2010).

Still, the analysis of antisocial punishment is in its infancy. In the present work, therefore, we investigate what personal and situational factors are associated with an individual's tendency to engage in antisocial punishment. Specifically, we focus on the interplay of individual differences in everyday sadism and existential threats to the self (i.e., mortality salience, MS). In this sense, our approach to examining the associations between these factors and antisocial punishment reflects a step in a new direction and constitutes a contribution to the understanding of antisocial punishment in social dilemma situations that addresses a gap in this field of study. The

following outlines the rationale for why we expect sadism and existential threats to the self to be crucial in engaging in antisocial punishment.

ANTISOCIAL PUNISHMENT AND SADISM

In the present work we argue that everyday sadists are particularly prone to engaging in antisocial punishment under specific conditions. The very essence of sadism is that sadists are motivated to dominate and to control other individuals by harming them because they experience pleasure through their cruelty (Cooke, 2001; Dietz, Hazelwood, & Warren, 1990; O'Meara, Davies, & Hammond, 2011). So far, sadism has principally been investigated in a clinical context and in descriptive analyses portraying individuals who experience pleasure when hurting and dominating others (e.g., Baumeister & Campbell, 1999; Baumeister & Vohs, 2004; Fromm, 1973; Piven, 2003). Nonetheless, sadistic actions also emerge in the subclinical population (Chabrol, Van Leeuwen, Rodgers, & Séjourné, 2009). Buckels, Trapnell, and Paulhus (2013) have documented that everyday people vary in their sadistic tendencies and showed that those with a relatively strong (as compared with a weak) sadistic disposition were more likely to engage in killing bugs and harming an innocent person, particularly when personal costs had to be incurred. Moreover, Buckels, Trapnell, and Paulhus (in press) document that everyday sadists are more likely to engage in trolling, a practice that reflects evil and destructive behavior towards innocent others on the internet. In the same vein, Reidy, Zeichner, and Seibert (2011) showed that the faster an individual responded to cruel images after a positive word was presented (i.e., implicit sadism) the more likely they were to engage in unprovoked aggression. This research in fact shows that everyday sadists exist and that these individuals engage in costly, harmful actions that control other individuals' personal states.

Taking up the notion of antisocial punishment, we argue that the punishment of cooperative others, which reflects aggressive behavior to dominate and to harm other individuals (Pfattheicher et al., in press; Sylwester et al., 2013), fits the evil mold of sadism. Thus, we

assumed that everyday sadists are prone to engaging in antisocial punishment. We expect that everyday sadists engage in antisocial punishment particularly when their self has been threatened. The rationale for this assumption is outlined in the following section.

EXISTENTIAL THREAT AND HARMING OTHERS

Humans have a fundamental psychological need to believe that they are a valuable being and therefore seek to have positive self-esteem (Pyszczynski, Greenberg, Solomon, Arndt, & Schimel, 2004). When the self is threatened individuals are motivated to restore their self-esteem (e.g., Leary, 1999; Leary & Baumeister, 2000), for instance when the self is existentially threatened by the recognition of one's own mortality (Greenberg, Solomon, & Arndt, 2008). Indeed, one main assumption of Terror Management Theory (TMT) is that humans have a fundamental psychological need for self-esteem to cope with the potentially paralyzing threat of one's own mortality (Pyszczynski et al., 2004).

One way to maintain self-esteem after the self has been threatened is to engage in harming and dominating others (Baumeister, Bushman, & Campbell, 2000; Baumeister, Smart, & Boden, 1996; Leary, 1999). In line with this perspective, Brown and Zeigler-Hill (2004) documented a positive relation between individual differences in dominance and self-esteem. Applying a causal analysis approach, Leary, Cottrell, and Phillips (2001) showed that strengthening one's perceived dominance in a leadership context increased self-esteem. Moreover, when the self was threatened via a social exclusion paradigm, as compared with a no-threat condition, individuals were more likely to engage in aggression towards an offender as well as an innocent third person (Twenge, Baumeister, Tice, & Stucke, 2001; Twenge & Campbell, 2003). In this regard, Baumeister and colleagues (1996) wrote that "a successful violent attack achieves a symbolic dominance over the other person, and so it affirms one's esteem to the extent of being superior to the victim" (p. 11). Building on these considerations, we argue that harming and dominating cooperative others

reflects one strategy to feel superior and to maintain one's self-esteem (cf. Crocker, Lee, & Park, 2004; Crocker & Park, 2004).

In sum, in the present work we build on (a) the theoretical account of TMT postulating that individuals are motivated to maintain their self-esteem after being existentially threatened (Pyszczynski et al., 2004), and (b) research showing that sadistic behaviors, like harming and aggressively dominating others, serve a self-esteem enhancing function (Baumeister et al., 1996; Crocker et al., 2004; Crocker & Park, 2004). Specifically, assuming antisocial punishment to be related to sadistic motives, we expected individuals with a disposition for sadistic tendencies to show increased engagement in antisocial punishment especially when being confronted with an existential threat (i.e., MS). We explore this hypothesis in one study as outlined in detail below.

METHOD

In this study, we measured individuals' dispositions to everyday sadism (Buckels et al., 2013; Paulus & Jones, in press) and existentially threatened the individuals' selves via a mortality salience manipulation (Burke, Martens, & Faucher, 2010; Greenberg et al., 1990) after participants had read the explanation of a public goods game. After the existential threat or a control treatment occurred, individuals played a typical public goods game with the option to costly punish other group members (cf. Fehr & Gächter, 2002).

Sample. The study consisted of 99 University of Ulm students (M_{age} = 21.09; 46.41% women).

Sadism. Dispositional sadism was measured using six items of the Varieties of Sadistic Tendencies Scale which directly assess sadism (Buckels et al., 2013; Paulus & Jones, in press).[1] The scale endpoints of the items were labeled (1) *not at all true* and (7) *completely true* (α = .67, M = 2.04, SD = 0.82).

Existential threat. Participants were randomly assigned to a MS condition or a dentist-visit control condition. Participants in the MS condition answered two open-ended questions about

death, while those in the dentist-visit condition were asked two questions about a visit to the dentist (cf. Jonas et al., 2008; Schindler et al., in press). When using such explicit death primes, a distractor is necessary to diminish consciousness of death (Arndt, Greenberg, & Cook, 2002). Therefore, as in many studies on TMT (Burke et al., 2010), participants filled out the 20-item Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988; Krohne, Egloff, Kohlmann, & Tausch, 1996) and a 5-item distractor questionnaire about sleep and waking patterns (Fritsche, Jonas, & Frankhänel, 2008).

Public goods game. We investigated antisocial punishment using a standard public goods game with the costly option to punish (cf. Fehr & Gächter, 2002; Pfattheicher & Keller, 2014). As in a typical public goods game, four players constituted one group (cf. Fehr & Gächter, 2002). Each player was endowed with 20 money units (MUs; 1 MU was equal to 1 € cent ~ 1.39 US$ cent) and was free to choose how many of these to keep and how many to contribute to a common group project (i.e., the public good). Each MU contributed was multiplied by 1.6. Next, each player received one fourth of the public good, independent of their contribution. Accordingly, it was always in the material self-interest of every individual to keep all of their MUs irrespective of how much the other three subjects contribute to the group project: if every group member invested 20 MUs, each subject would earn (80 × 1.6) / 4 MUs, that is, 32 MUs. If one group member engaged in free-riding (e.g., s/he contributes 0 MUs) and the other three group members still invest their 20 MUs, the free-rider earns 44 MUs (20 MUs already owned plus one fourth of the public good, that is, 24 MUs) and each of the other three group members earns 24 MUs.

Following this stage, each player was given information on the contributions made by the other three players and was then given the option to punish them by investing their own MUs (between 0 and 10 for each player) which reduced the selected other player's payoff by a factor of three (e.g., the investment of 2 MUs decreases the payoff of another by 6 MUs).[2]

Six periods of the public goods game were played under anonymous conditions. All interactions were computer-mediated using z-Tree (Fischbacher, 2007), and all decisions were made simultaneously. Participants were told that the group composition changed from period to period to exclude direct reciprocity accounts (Trivers, 1971). Participants were paid their earnings privately (M = €1.25 ~ $1.74, SD = 0.17) at the end of the session (and also received a chocolate bar or a beverage).

Antisocial punishment. In line with Herrmann et al. (2008), antisocial punishment was computed by summarizing the MUs across the six periods that were used by each player for the punishment of other players who contributed *as much or more* than the player him/herself.[3]

RESULTS

Preliminary results. In order to give the reader an impression of the contributions to the public good and investments in antisocial punishment, the descriptive statistics are reported first. The mean number of MUs contributed to the public good across the six periods (maximum 6 x 20 MUs = 120 MUs) was 68.48 MUs (SD = 29.49). The mean number of MUs invested in antisocial punishment across the six periods was 3.02 MUs (SD = 8.30). Thirty-seven out of ninety-nine participants (34.34%) engaged in antisocial punishment. Contribution to the public good and investment in antisocial punishment were negatively correlated (r = -.19, p = .06). The PANAS values were not significantly affected by the manipulation (ps > .91), neither was contribution to the public good (p = .41).

Main results. We report standard OLS regression and also Tobit regression to account for participants scoring zero on antisocial punishment (cf. McDonald & Moffitt, 1980; Pfattheicher & Keller, 2013). We also applied bootstrapping (based on 1000 resamples) to test for statistical robustness and to apply a non-parametric statistical test (Hayes, 2013). The results are displayed in Table 1. The findings revealed a significant Sadism x Condition interaction. Decomposing this interaction (Aiken & West, 1991; Preacher, Rucker, & Hayes, 2007) revealed a significant effect

of the existential threat manipulation, but only when an individual's disposition for sadism was relatively strong (see Table 1). That is, those with relatively strong sadistic tendencies engaged in antisocial punishment when their self was existentially threatened (as compared with the control condition), which supports our hypothesis.

DISCUSSION

In 1938 the French Nobel Prize winning author Albert Camus started writing *Caligula*. In this play, Prince Caligula is confronted with the death of his beloved sister and mistress, which terrorizes his mind. After this disturbing event, Caligula reveals his evil side by murdering and bringing suffering upon those close to him. In the present paper we have, in fact, delivered empirical data that supports the plot of Camus' play. Specifically, we have shown that individuals who report a disposition for sadistic behaviors are particularly likely to engage in antisocial punishment after having been existentially threatened.

Pfattheicher and colleagues (in press) have argued that antisocial punishment reflects aggressive behavior to dominate and to harm other individuals (see also Sylwester et al., 2013). In line with these findings we were able to document that those individuals who are motivated to dominate and control others by harming them, that is, individuals who report a disposition for sadism, are the ones who engage in antisocial punishment after being existentially threatened. This finding in fact strengthens the conceptualization of antisocial punishment as a type of behavior executed to dominate and to harm others. As such, the present work contributes to a better understanding of antisocial punishment, which is important given that research on social dilemma situations has almost completely neglected antisocial punishment thus far (Dreber & Rand, 2012; Herrmann et al., 2008).

From a social dilemma perspective it is important to consider the conditions under which costly punishment of cooperative others may emerge. Proposing a system of costly punishment in social dilemma situations seems to be, at first sight, a worthwhile approach given its positive

effects on the level of cooperation in social dilemma situations (Balliet et al., 2011). However, as shown in this work and in work of Herrmann and colleagues (2008), antisocial punishment reliably emerges when a system of costly punishment is implemented. As such, knowing who engages in antisocial punishment and under what conditions can foster attempts to prevent and to deal with antisocial punishment.

The results obtained are also relevant from the perspective of TMT (Greenberg et al., 2008), in particular regarding the impact of MS on antisocial behavior (cf. Schindler, Reinhard, & Stahlberg, 2013). We have documented that antisocial punishment in everyday sadists emerges after they are reminded of their own mortality which supports the idea that antisocial punishment may be used by certain people (e.g., sadists) as a self-esteem enhancing strategy to counter the fear of death. This is in line with the notion that harming and dominating others can reflect a strategy to feel superior and to maintain one's self-esteem (e.g., Baumeister et al., 2000; Baumeister et al., 1996; Brown & Zeigler-Hill, 2004; Crocker et al., 2004; Crocker & Park, 2004).

We would like to acknowledge that our results may not be specific to *existential* threats to the self. In fact, other research has threatened the self differently (e.g., through a bad evaluation of one's essay; Bushman & Baumeister, 1998) and obtained strong aggressive responses following this threat to one's self. That is to say, future research could contribute to the question of whether the observed effects are specific to existential threats. Given that we have argued that antisocial punishment may reflect a type of behavior that allows the maintenance of self-esteem through aggressively dominating others, we would also expect that antisocial punishment is more likely to emerge when the self of everyday sadists is threatened in other ways.

The present work not only contributes to a better understanding of antisocial punishment but also contributes to research on everyday sadism. So far, sadism has not received much attention in the field of social psychology. This research shows a behavioral tendency (i.e., antisocial punishment) that corresponds to the main characteristics of sadism. That is, the present

research's findings suggest that antisocial punishment appears to be a behavioral tendency executed by sadists. We have further revealed a boundary condition under which everyday sadists are likely to engage in harming others (i.e., when their self is existentially threatened). Thus, the present research contributes to the understanding of under what conditions everyday sadists may engage in evil behavior.

At this point we would also like to acknowledge that the present work remains silent regarding the relation of antisocial punishment and sadism to other antisocial traits, for instance the dark triad of psychopathy, narcissism, and Machiavellianism (e.g., Jones & Paulhus, 2012). In fact, one can conceptually distinguish sadism from the dark triad (cf. Buckels et al., 2013). Psychopaths are empathy-lacking, impulsive individuals, ready to hurt others to serve their selfish goals, especially when being physically insulted (Jones & Paulhus, 2010). The core of narcissism is self-ascribed grandiosity and the ego-focus narcissists possess and their readiness to hurt others when being personally insulted (Bushman & Baumeister, 1998). Finally, individuals possessing a strong Machiavellian tendency are intensely focused on what will benefit them and are ready to exploit others. Empirically, Buckels and colleagues (2013) were able to document that narcissism and psychopathy were positively related to harming innocent others. However, only sadism was related to harming innocent others when harming others involved personal costs. Accordingly, given that antisocial punishment involves costs, we would predict that only sadism should be related to the costly behavior of antisocial punishment whereas psychopathy, narcissism, and Machiavellianism should not predict this tendency. Future research could empirically clarify this point.

To conclude, the present work represents a new and promising approach to the study of antisocial punishment and its underlying forces and boundary conditions. It takes into account that behavior in social dilemma situations is heavily influenced by the interplay of personal and situational factors. The results indicate the importance of taking antisocial personality variables

(e.g., sadism) and situational boundary conditions (e.g., existential threat) as well as their interplay into account in order to reach a comprehensive understanding of individuals' behavior in social dilemma situations.

Footnotes

[1] The full scale consists of seven items. We did not assess the item "I enjoy hurting my partner during sex (or pretending to)" because of ethical reasons. Moreover, we ran seven sessions of the public goods game. In three sessions dispositional sadism was assessed before the explanation of the public goods game was read by participants, in four sessions it was assessed after participants played the public goods game. Order did not moderate the effects ($p = .79$).

[2] In this study, we predetermined the contributions of the other three players in each period the participants took part in to eliminate the variability that comes into play when the game involves real interactions. So, we held the contributions of the other participants constant. The contributions of the other players were randomly drawn from a previous study involving real interactions, thus representing real behavior. The contributions of the other three players were as follows: Period 1: 5, 16, 20; Period 2: 6, 9, 16; Period 3: 2, 20, 14; Period 4: 16, 0, 14; Period 5: 15, 4, 15; Period 6: 20, 8, 20. How much participants were punished in each period was determined using previous data involving real interactions. If participants contributed less than 6 MUs, they were punished with 3-2-4-3-2-4 MUs (3 MUs in the first period, 2 MUs in the second and so on). If participants contributed between 6 and 13 MUs, they were punished with 2-1-3-2-1-3 MUs, and if participants contributed more than 13 MUs, they were punished with 1-0-2-1-0-2 MUs (to realize antisocial punishment).

[3] Results for the punishment of uncooperative individuals are reported in another manuscript (Pfattheicher & Schindler, 2014). In short, we found that costly punishment of uncooperative individuals was significantly higher under MS vs. control conditions (no significant main or interaction effect involving sadism was found). In the present manuscript, we exclusively report on the findings referring to the punishment of cooperative individuals (antisocial punishment). Accordingly, neither of the research reports is redundant and they do not reflect

duplicate publications. Nonetheless, we want to be transparent regarding the fact that specific results from the present study are included in another research report.

References

Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions*. Thousand Oaks, CA: Sage Publications.

Arndt, J., Greenberg, J., & Cook, A. (2002). Mortality salience and the spreading activation of worldview-relevant constructs: Exploring the cognitive architecture of terror management. *Journal of Experimental Psychology: General, 131*, 307-324.

Balliet, D., Mulder, L. B., & van Lange, P. A. (2011). Reward, punishment, and cooperation: A meta-analysis. *Psychological Bulletin, 137*, 594-615.

Baumeister, R. F., Bushman, B. J., & Campbell, W. K. (2000). Self-esteem, narcissism, and aggression. Does violence result from low self-esteem or from threatened egotism? *Current Directions in Psychological Science, 9*, 26-29.

Baumeister, R. F., & Campbell, W. K. (1999). The intrinsic appeal of evil: Sadism, sensational thrills, and threatened egotism. *Personality and Social Psychology Review, 3*, 210-221.

Baumeister, R. F., Smart, L., & Boden, J. M. (1996). Relation of threatened egotism to violence and aggression: The dark side of high self-esteem. *Psychological Review, 103*, 5-33.

Baumeister, R. F., & Vohs, K. D. (2004). Four roots of Evil. In A. G. Miller (Ed.), *The social psychology of good and evil* (pp. 85-101). New York: The Guilford Press.

Bernhard, H., Fischbacher, U., & Fehr, E. (2006). Parochial altruism in humans. *Nature, 442*, 912-915.

Brown, R. P., & Zeigler-Hill, V. (200F4). Narcissism and the non-equivalence of self-esteem measures: A matter of dominance? *Journal of Research in Personality, 38*, 585-592.

Buckels, E. E., Jones, D. N., & Paulhus, D. L. (2013). Behavioral confirmation of everyday sadism. *Psychological Science, 24*, 2201-2209.

Buckels, E. E., Trapnell, P. D., & Paulhus, D. L. (in press). Trolls just want to have fun. *Personality and Individual Differences.*

Burke, B. L., Martens, A., & Faucher, E. H. (2010). Two decades of terror management theory: A meta-analysis of mortality salience research. *Personality and Social Psychology Review, 14,* 155-195.

Bushman, B. J., & Baumeister, R. F. (1998). Threatened egotism, narcissism, self-esteem, and direct and displaced aggression: Does self-love or self-hate lead to violence? *Journal of personality and social psychology, 75*, 219-229.

Bushman, B. J., & Huesmann, L. R. (2010). Aggression. In S. T. Fiske, D. T. Gilbert & G. Lindzey (Eds.), *Handbook of social psychology* (5th ed., pp. 833-863). New York: John Wiley & Sons.

Carré, J. M., & Mehta, P. H. (2011). Importance of considering testosterone-cortisol interactions in predicting human aggression and dominance. *Aggressive Behavior, 37*, 1-3.

Chabrol, H., Van Leeuwen, N., Rodgers, R., & Séjourné, N. (2009). Contributions of psychopathic, narcissistic, Machiavellian, and sadistic personality traits to juvenile delinquency. *Personality and Individual Differences, 47*, 734-739.

Cooke, D. J. (2001). Psychopathy, sadism and serial killing. In A. Raine & J. Sanmartín (Eds.), *Violence and Psychopathy* (pp. 123-137). New York: Springer.

Crocker, J., Lee, S. J., & Park, L. E. (2004). The pursuit of self-esteem: Implications for good and evil. In A. G. Miller (Ed.), *The social psychology of good and evil* (pp. 271-302). New York: The Guilford Press.

Crocker, J., & Park, L. E. (2004). The costly pursuit of self-esteem. *Psychological Bulletin, 130*, 392-414.

Dietz, P. E., Hazelwood, R. R., & Warren, J. (1990). The sexually sadistic criminal and his offenses. *Journal of the American Academy of Psychiatry and the Law Online, 18*, 163-178.

Dreber, A., & Rand, D. G. (2012). Retaliation and antisocial punishment are overlooked in many theoretical models as well as behavioral experiments. *Behavioral and Brain Sciences, 35*, 24-24.

Fehr, E., & Gächter, S. (2002). Altruistic punishment in humans. *Nature, 415*, 137-140.

Fischbacher, U. (2007). z-Tree: Zurich toolbox for ready-made economic experiments. *Experimental Economics, 10*, 171-178.

Fritsche, I., Jonas, E., & Fankhänel, T. (2008). The role of control motivation in mortality salience effects on ingroup support and defense. *Journal of Personality and Social Psychology, 95,* 524-541.

Fromm, E. (1973). *The anatomy of human destructiveness*. New York: Holt, Rinehart & Winston.

Gächter, S., & Herrmann, B. (2009). Reciprocity, culture and human cooperation: Previous insights and a new cross-cultural experiment. *Philosophical Transactions of the Royal Society B,* 364, 791-806.

Goette, L., Huffman, D., Meier, S., & Sutter, M. (2012). Competition between organizational groups: Its impact on altruistic and anti-social motivations. *Management Science, 58*, 948-960.

Greenberg, J., Pyszczynski, T., Solomon, S., Rosenblatt, A., Veeder, M., Kirkland, S., & Lyon, D. (1990). Evidence for terror management theory 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., Solomon, S., & Arndt, J. (2008). A basic but uniquely human motivation: Terror management. In J. Y. Shah & W. L. Gardner (Eds.), *Handbook of motivation science* (pp. 114-134). New York: Guilford Press.

Hayes, A. F. (2013). *Introduction to mediation, moderation, and conditional process analysis*. New York: The Guilford Press.

Herrmann, B., Thöni, C., & Gächter, S. (2008). Antisocial punishment across societies. *Science, 319,* 1362-1367.

Jonas, E., Martens, A., Niesta, D., Fritsche, I., Sullivan, D., & Greenberg, J. (2008). Focus theory of normative conduct and terror management theory: The interactive impact of mortality salience and norm salience on social judgment. *Journal of Personality and Social Psychology, 95*, 1239–1251.

Jones, D. N., & Paulhus, D. L. (2010). Different provocations trigger aggression in narcissists and psychopaths. *Social Psychological and Personality Science, 1*, 12-18.

Jones, D. N., & Paulhus, D. L. (2012). Differentiating the dark triad within the interpersonal circumplex. In L. M. Horowitz & S. N. Strack (Eds.), *Handbook of interpersonal theory and research* (pp. 249-267). Hoboken, NJ: Wiley & Sons.

Krohne, H. W., Egloff, B., Kohlmann, C.-W., & Tausch, A. (1996). Untersuchungen mit einer deutschen Version der "Positive and Negative Affect Schedule" (PANAS) [Studies with a German version of the "Positive and Negative Affect Schedule" (PANAS)]. *Diagnostica, 42,* 139-156.

Leary, M. R. (1999). The social and psychological importance of self-esteem. In R. M. Kowalski & M. R. Leary (Eds.), *The social psychology of emotional and behavioral problems: Interfaces of social and clinical psychology* (pp. 197-221). Washington, DC: American Psychological Association.

Leary, M. R., & Baumeister, R. F. (2000). The nature and function of self-esteem: Sociometer theory. In M. P. Zanna (Ed.), *Advances in Experimental Social Psychology* (Vol. 32, pp. 1-62). New York: Academic Press.

Leary, M. R., Cottrell, C. A., & Phillips, M. (2001). Deconfounding the effects of dominance and social acceptance on self-esteem. *Journal of Personality and Social Psychology, 81*, 898-909.

McDonald, J. F., & Moffitt, R. A. (1980). The uses of Tobit analysis. *The Review of Economics and Statistics, 62*, 318-321.

Mehta, P. H., & Josephs, R. A. (2010). Testosterone and cortisol jointly regulate dominance: Evidence for a dual-hormone hypothesis. *Hormones and Behavior, 58*, 898-906.

Minson, J. A., & Monin, B. (2012). Do-gooder derogation disparaging morally motivated minorities to defuse anticipated reproach. *Social Psychological and Personality Science, 3*, 200-207.

Miller, A. G. (2004). *The social psychology of good and evil*. New York: The Guilford Press.

Monin, B., Sawyer, P. J., & Marquez, M. J. (2008). The rejection of moral rebels: Resenting those who do the right thing. *Journal of Personality and Social Psychology, 95*, 76-93.

O'Meara, A., Davies, J., & Hammond, S. (2011). The psychometric properties and utility of the short sadistic impulse scale (SSIS). *Psychological Assessment, 23*, 523-531.

Ostrom, E. (1990). *Governing the commons*. Cambridge, MA: Cambridge University Press.

Paulhus, D. L., & Jones, D. N. (in press). Measuring dark personalities. In G. J. Boyle, D. H. Saklofske & G. Matthews (Eds.), *Measures of personality and social psychological constructs*. San Diego, CA: Academic Press.

Pfattheicher, S., & Keller, J. (2013). Vigilant self-regulation and costly punishment in public goods situations. *European Journal of Personality, 27*, 346-354.

Pfattheicher, S., & Keller, J. (2014). Towards a biopsychological understanding of costly punishment: The role of basal cortisol. *PLOS ONE, 9*, e85691.

Pfattheicher, S., Landhäußer, A., & Keller, J. (in press). Individual differences in antisocial punishment in public goods situations: The interplay of cortisol with testosterone and dominance. *Journal of Behavioral Decision Making*.

Pfattheicher, S., & Schindler, S. (2014). In defense for fairness: Mortality salience increases costly punishment of uncooperative others in public goods situations. *Manuscript in preparation*.

Piven, J. S. (2003). Death, repression, narcissism, misogyny. *The Psychoanalytic Review, 90*, 225-260.

Preacher, K. J., Rucker, D. D., & Hayes, A. F. (2007). Addressing moderated mediation hypotheses: Theory, methods, and prescriptions. *Multivariate Behavioral Research, 42*, 185-227.

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.

Reidy, D. E., Zeichner, A., & Seibert, L. A. (2011). Unprovoked aggression: Effects of psychopathic traits and sadism. *Journal of Personality, 79*, 75-100.

Schindler, S., Reinhard, M.-A., & Stahlberg, D. (2013). Tit for tat in the face of death: The effect of mortality salience on reciprocal behavior. *Journal of Experimental Social Psychology, 49*, 87-92.

Schindler, S., Reinhard, M.-A., Stahlberg, D., & Len, A. (in press). Quid pro quo: The effect of individuals' exchange orientation on prosocial behavior and the moderating role of mortality salience. *Social Influence.*

Sylwester, K., Herrmann, B., & Bryson, J. J. (2013). Homo homini lupus? Explaining antisocial punishment. *Journal of Neuroscience, Psychology, and Economics, 6*, 167-188.

Trivers, R. L. (1971). The evolution of reciprocal altruism. *Quarterly Review of Biology, 46*, 35-57.

Twenge, J. M., Baumeister, R. F., Tice, D. M., & Stucke, T. S. (2001). If you can't join them, beat them: Effects of social exclusion on aggressive behavior. *Journal of Personality and Social Psychology, 81*, 1058-1069.

Twenge, J. M., & Campbell, W. K. (2003). "Isn't it fun to get the respect that we're going to deserve?" Narcissism, social rejection, and aggression. *Personality and Social Psychology Bulletin, 29*, 261-272.

van Lange, P. A. M., Balliet, D. P., Parks, C. D., & van Vugt, M. (2014). *Social dilemmas: Understanding human cooperation*. Oxford: Oxford University Press.

van Lange, P. A. M., Joireman, J., Parks, C. D., & van Dijk, E. (2013). The psychology of social dilemmas: A review. *Organizational Behavior and Human Decision Processes, 120*, 125-141.

Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology, 54*, 1063-1070.

Table 1. *Regression coefficients of the main analyses*

Criterion: Antisocial Punishment	OLS Regression			Tobit Regression
	B (*SE B*)	*β*	*Bootstrapped 95% confidence interval*	*Coefficient (SE)*
Constant	1.99 (1.05)		[0.77; 3.44]	3.91 (1.09)
Condition	1.91 (1.53)	0.12	[-0.72; 5.44]	-1.91 (1.50)
Sadism	-0.73 (1.44)	-0.72	[-2.63; 1.12]	-0.73 (1.41)
Sadism × Condition	6.33 (1.90)**	0.47	[1.60; 10.53]	6.33 (1.86)***
Effect of the Condition at relatively low Sadism	-3.25 (2.17)	-0.20	[-6.33; 0.05]	-2.41 (5.54)
Effect of the Condition at relatively high Sadism	7.08 (2.18)**	0.43	[1.21; 13.32]	15.17 (5.53)**

Note. * $p < .05$, ** $p < .01$, *** $p < .01$; Sadism was mean-centered; relatively low Sadism refers to 1 standard deviation below mean, relatively high Sadism refers to 1 standard deviation above mean; control condition = 0, mortality salience condition = 1

APPENDIX C

Schindler, S., Reinhard, M.-A., Stahlberg, D., & Len, A. (2014). Quid pro quo: The effect of individuals' exchange orientation on prosocial behavior and the moderating role of mortality salience. *Social Influence*, *9*, 242–254.

Quid Pro Quo: The Effect of Individuals' Exchange Orientation on Prosocial Behavior and the Moderating Role of Mortality Salience

Simon Schindler, Marc-André Reinhard, and Dagmar Stahlberg

University of Mannheim

Simon Schindler (Corresponding author), Department of Social Science, University of Mannheim, A5, 68131 Mannheim

Marc-André Reinhard, Department of Social Science, University of Mannheim, A5, 68131 Mannheim

Dagmar Stahlberg, Department of Social Science, University of Mannheim, A5, 68131 Mannheim

Address correspondence to

Simon Schindler
University of Mannheim
Department of Social Science
A5, 68131 Mannheim
Phone: ++49(0)621-181-2037
Fax: ++49 (0)621 181-2038
E-Mail: simon.schindler@uni-mannheim.de

Word count

Abstract:	131
Main text:	3401
References:	1455
Footnotes:	165
	5152

Abstract

Individuals high in exchange orientation expect immediate and comparable rewards in order to establish exchange equality after they have provided rewards for others. Therefore, such individuals should be less likely than individuals low in exchange orientation to behave prosocially because doing such usually leads to exchange inequality (i.e., postponement of reciprocal expectations). However, research on terror management theory has indicated that an adherence to prosocial norms increases after mortality salience, especially in situations where those norms are prescribed and cognitively focused. Based on this, we predicted and found evidence that when participants who were high (vs. low) in exchange orientation were directly asked in a face-to-face interaction to donate their participation payment to a charity, they were less likely to donate unless they had first been reminded of their own death.

Keywords: exchange orientation, prosocial behavior, terror management theory, mortality salience

Quid Pro Quo: The Effect of Individuals' Exchange Orientation on Prosocial Behavior and the Moderating Role of Mortality Salience

Research on exchange orientation suggests that individuals who are high in exchange orientation maintain exchange equality (e.g., Murstein, Cerreto, & MacDonald, 1977), and further, are negatively affected when inequality is experienced (e.g., Buunk, Doosje, Jans, & Hopstaken, 1993; Buunk & Schaufeli, 1999). With this study, we investigated the effect of dispositional exchange orientation on prosocial behavior because acting prosocially usually implies exchange inequality (i.e., postponement of reciprocal expectations). In this case, we assumed individuals who are high in exchange orientation act less prosocially due to their motivation to maintain exchange equality. Additionally, we examined whether being confronted with one's own death would moderate the assumed effect of exchange orientation on prosocial behavior.

Following the rules of social exchange plays an important role in social relationships (for an overview, see Cropanzano & Mitchell, 2005). Reciprocity is probably the best-known rule of social exchange. Defined as a norm, it is assumed to be "one of the universal 'principal components' of moral codes" (Gouldner, 1960, p. 161) that exists in all known societies. It prescribes that people should support, and not injure, those who previously supported them (Gouldner, 1960; Uehara, 1995). Accordingly, a great deal of research in social psychology has supported the idea that performing a favor will lead to higher compliance toward a future request by the favor-doer (e.g., Cialdini, Green, & Rusch, 1992; Edlund, Sagarin, & Johnson, 2007; Regan, 1971; Whatley, Webster, Smith, & Rhodes, 1999). Furthermore, social exchange approaches (e.g., equity theory) basically assume that relationships are, in general, more satisfying and stable when rewards for each partner are perceived to be reciprocal and equal (Adams, 1963; LaGaipa, 1977). For many different types of relationships, including helping relationships, exchange inequality (i.e., being underbenefited as well as being overbenefited) was shown to lead to negative feelings (e.g.,

Buunk & Schaufeli, 1999; Hatfield & Sprecher, 1983; Smets, Visser, & Oort, 2004), such as feelings of obligation, indebtedness, fear, and uncertainty about being unable to repay the debt (Greenberg & Westcott, 1983). Rook (1987) suggested that the perception of giving more support than one receives leads to feelings of unfairness and resentment.

Though reciprocity is assumed to be a universal norm in general, research has shown that individuals vary in the degree to which they endorse the norm of reciprocity (e.g., Clark & Mills, 1979; Eisenberger, Lynch, Aselage, & Rohdieck, 2004; Murstein et al., 1977; Perugini, Gallucci, Presaghi, & Ercolani, 2003). Analogous to this, Murstein and his colleagues (1977) introduced the concept of dispositional exchange orientation, suggesting that exchange-oriented individuals strongly care about direct reciprocity, expect immediate and comparable rewards when they have provided rewards for others, and feel uncomfortable when they receive favors that they cannot immediately reciprocate. This concept was shown to play a crucial role for satisfaction in relationships, as well as in health and well-being (Buunk et al., 1993; Buunk & Prins, 1998; Buunk & VanYperen, 1991; Milardo & Murstein, 1979; Murstein et al., 1977; Murstein, Wadlin, & Bond, 1987). Buunk and VanYperen (1991), for instance, found that for individuals high in exchange orientation perceived equality was an important factor for marital satisfaction. In contrast, individuals low in exchange orientation (i.e., for whom the input–output ratio did not matter) overall were more satisfied with their relationship. Moreover, Buunk et al. (1993) found that individuals high (vs. low) in exchange orientation were more negatively affected (e.g., irritated, depressed, confused, nervous) when they experienced a lack of perceived reciprocity, that is, when they felt underbenefited ("You owe me something!") or overbenefited ("I owe you something!").

While research has investigated the idea that perceiving exchange inequality can lead to negative affect, the behavioral consequences of this effect in a prosocial context, for example, have barely been considered. To our knowledge, there is only one study by Bell, Abrahams, Clark, and Schlatter (1996) that has indicated that for individuals high in exchange

orientation, the door-in-the-face strategy—a persuasion strategy based on the norm of reciprocity (Cialdini et al., 1975)—increased the compliance rate toward a request. They also found that participants in the control condition were less likely to donate when they were high (vs. low) in exchange orientation. However, this effect was not discussed theoretically. The case of prosocial behavior seems particularly interesting because it usually involves the temporary postponement of reciprocal expectations. Based on the assumption that individuals who are high in exchange orientation expect immediate and comparable rewards when they have provided rewards for others, and furthermore are negatively affected when they perceive exchange inequality, we stress the idea that those individuals are less likely to behave prosocially if it implies abstaining from their rewards (i.e., exchange inequality).

Following the rules of social exchange can also serve an anxiety-buffering function when confronted with one's own death (Schindler, Reinhard, & Stahlberg, 2012, 2013). According to terror management theory (TMT; Greenberg, Pyszczynski, & Solomon, 1986), cultural worldviews function as an anxiety buffer against the ever-present terror of potential death, by providing a meaningful, orderly conception of reality that contains a set of standards and values. By living up to those cultural standards, people believe that they are valuable beings in a meaningful reality. Based on this idea, the mortality salience (MS) hypothesis states that reminding people of their mortality increases their motivation to defend and bolster their own cultural worldview, resulting in derogating those who violate important cultural standards and supporting those who uphold them (for an overview, see Greenberg, Solomon, & Arndt, 2008).

Referring to norms of social exchange, research has recently found that MS increased adherence to the norm of reciprocity (Schindler et al., 2012, 2013). For example Schindler et al. (2013) indicated that after having received a favor (i.e., espresso on the house), participants gave a higher tip to the server under MS. Furthermore, research has indicated that MS increases prosocial attitudes and behavior (Blackie & Cozzolino, 2011; Hirschberger, Ein-

Dor, & Almakias, 2008; Joireman & Duell, 2005, 2007; Jonas, Schimel, Greenberg, & Pyszczynski, 2002). For example, Jonas et al. (2002) showed that participants reported more favorability toward charities when they were interviewed in close proximity to a funeral home (vs. several blocks away). Moreover, Joireman and Duell (2005) found that MS led proself individuals to endorse self-transcendent (i.e., prosocial) values, such as protecting the environment or helpfulness. However, this effect did not occur for prosocial individuals because these individuals already appreciated and practiced those values and behaviors. To explain the opposite effects of MS, such as increased aggression against worldview-threatening others (McGregor et al., 1998), or greedy acquisition (e.g., Arndt, Solomon, Kasser, & Sheldon, 2004; Kasser & Sheldon, 2000), research on TMT has suggested that situational salience is a crucial factor. In line with this idea, several studies have shown that priming prosocial norms increases prosocial behavior after MS (Galliot, Stillman, Schmeichel, Maner, & Plant, 2008; Jonas, Sullivan, & Greenberg, 2013; Jonas et al., 2008). Jonas et al. (2013), for example, recently found a fairness norm prime to increase generous behavior toward an anonymous person.

As reasoned above, in a situation of exchange inequality, individuals who are high in exchange orientation are expected to act less prosocially if doing so leads to exchange inequality. However, according to research on TMT, being confronted with their own death might increase their prosocial behavior, especially when prosocial norms are cognitively focused. Thus, although individuals high in exchange orientation, in general, are motivated to maintain exchange equality, we assume MS to increase motivation to act according to the salient norm. Accordingly, we expect that individuals high (vs. low) in exchange orientation are less likely to behave prosocially if doing so implies they must abstain from their own rewards (i.e., exchange inequality)—but only until they are reminded of their own death. That is, after MS, exchange orientation is not expected to affect prosocial behavior, especially in a situation where prosocial norms are prescribed. For the current study, we assumed a

donation scenario to constitute a situation where prosocial norms are of high cognitive focus, especially when the charity organization is explicitly introduced as being in support of disadvantaged children. Beyond that, research on cooperation in social dilemmas (e.g., Axelrod, 1984; Fox & Guyer, 1978) has suggested that cooperation decreases when decisions are made anonymously. Therefore, we assumed a direct face-to-face interaction to further increase prosocial norm salience by inducing normative pressure and social desirability to follow the prosocial request. Based on this, we hypothesized an interaction effect of participants' dispositional exchange orientation and experimental condition (mortality vs. control) on the donation of participation payment to a charity (i.e., prosocial behavior).

Method

Participants in this experiment included 67 students (39 female, 28 male; age range 19–29 years, $M = 21.64$, $SD = 2.00$) recruited on the campus of a German university. Before having agreed to participate, participants were told that participation would take about 30 minutes and that they would be paid 5 Euros (approximately $6 US), assuming a balanced and justified relation between experiment duration (costs) and participation payment (benefit). Once participants came into the lab, the experimenter assigned them to a computer. The cover story was as follows: Participants read that the experiment was about personality traits and information processing. After having filled out the demographic measures, the revised Exchange-Orientation Scale (Murstein et al., 1987) was used to assess participants' dispositional exchange orientation (e.g., "I don't like people who don't fulfill their obligations to me"; "I usually do not forget if I owe someone a favor or if someone owes me a favor"; "If I take a friend out to dinner, I expect him or her to do the same for me sometime").[1] Participants responded to all 19 items ($\alpha = .68$) on a 7-point continuous scale ranging from 1 (*not true for me*) to 7 (*very true for me*).[2] To avoid demand characteristics or priming effects of the measurement, participants were then asked to do several analogy tasks from the Cognitive Ability Test 4–12 + R (Heller & Perleth, 2000), a German version of the CogAT by

Thorndike and Hagen (1993), assessing the mental ability of students from Grade 4 to 12. Participants were not given any feedback on their performance. Afterwards, participants were randomly assigned to the MS or control condition. As is common in TMT experiments, participants in the MS condition answered two open-ended questions about death, whereas participants in the control condition answered two open-ended questions about dental pain (DP; see Rosenblatt, Greenberg, Solomon, Pyszczynski, & Lyon, 1989): "Please briefly describe the emotions that the thought of your own death arouses in you" and "Jot down, as specifically as you can, what you think will happen to you physically as you die and once you are physically dead." The dental pain control treatment consisted of parallel questions with respect to the experience of dental pain. When using such explicit death primes, a distractor is necessary to elicit effects of distal defense (e.g., Arndt, Greenberg, & Cook, 2002). Therefore, as in most studies on TMT (see Burke, Martens, & Faucher, 2010), participants filled out 20 items of the Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988). Then, the experiment ended and participants were told to enter the room next door to receive their participation payment. There, they received a 5 Euro bill by a confederate. Subsequently, the confederate introduced herself as a student assistant who was privately supporting the charity organization *Big Brothers, Big Sisters*. It was further pronounced that the organization involves a mentoring program for disadvantaged children. Then, participants were asked the following:

> Big Brothers, Big Sisters regularly organizes events for children and their mentors, such as "Cook'n'Save" classes, where children learn about healthy cooking and adequate nutrition. Since Big Brothers, Big Sisters is a volunteer-based program, donations are sorely needed. You could support Big Brothers, Big Sisters by sponsoring such a class for a child. Would you like to donate your 5 Euro to enable a child to participate in a "Cook'n'Save" class?

In this scenario, participants were forced to choose between a donation of their full payment and no donation. Thus, the dependent measure (prosocial behavior) was binary.[3] Participants who agreed with the request were asked to drop their 5 Euro bill into a donation box, which was actually given to Big Brothers, Big Sisters. After having made their decision, participants were thanked and fully debriefed.

Results

First, the data were checked for any effects of MS on the PANAS and, consistent with prior research on TMT, no effects were found (Fs < 1).[4] To test our hypothesis, we used a logistic regression with dispositional exchange orientation, mortality condition, and the two-way interaction term (Exchange Orientation × Mortality Condition) to predict the probability of donation. We coded *donation* as 1 (n = 40) and *no donation* as 0 (n = 27). Exchange orientation as a predictor was standardized, and mortality condition was dummy coded, with MS as 1 and DP as 0. Exchange orientation was hypothesized to determine the probability of donation, depending on the mortality condition.

Mortality condition and exchange orientation were both entered simultaneously in a first analytical step (see Model 1, Table 1). The analysis revealed that exchange orientation significantly predicted the probability of donation, b = –0.68, p = .017, odds ratio = 0.51, indicating that participants high in exchange orientation were less likely to donate. Furthermore, there was no significant effect of mortality condition on donation decision, b = 0.64, p = .230, odds ratio = 1.90. As can be seen in Table 1, this first model significantly predicted participants' donation decision, $\chi^2(1, N=67) = 8.63$, p = .013, accounting for approximately 16% (Nagelkerkes R^2) of the variance. In a second analytical step, the interaction term (Exchange Orientation × Mortality Condition) was entered into the model (see Model 2, Table 1). As hypothesized, the interaction term significantly predicted participants' donation decision, b = 1.25, p = .049, odds ratio = 3.50, increased the χ^2 value

compared to Model 1 by 4.30 (p = .038), and resulted in a significant overall fit, $\chi^2(1, N=67) = 12.93$, $p < .005$, which accounted for approximately 24% (Nagelkerkes R^2) of the variance.

We probed the interaction by testing the effect of exchange orientation on probability of donation for the MS and DP conditions (Hayes & Matthes, 2009). The analysis revealed that exchange orientation significantly predicted the probability of donation in the DP condition, $b = -1.30$, p = .007. Thus, in line with our assumption, the higher participants were in exchange orientation, the lower the probability of donating their participation payment (see Figure 1). However, exchange orientation was not a significant predictor in the MS condition, p = .92. We additionally probed the interaction by testing the effect of mortality condition on probability of donation for high (1 SD above the mean) and low (1 SD below the mean) exchange orientation. The analysis indicated that MS significantly increased the probability of donation for participants who were high in exchange orientation, $b = 1.81$, p = .027, odds ratio = 6.09, but not for participants who were low in exchange orientation, p = .424. In other words, participants under MS who reported a high exchange orientation were more likely to donate their participation payment than were participants in the DP condition. No effect of sex on probability of donation was found, $b = .017$, p = .888.

Discussion

Results of the current study indicated that the probability of donating the participation payment decreases as exchange orientation increases. We interpret this finding as evidence for the hypothesis that individuals who are high in exchange orientation behave less prosocially compared to individuals who are low in exchange orientation because prosocial behavior usually involves exchange inequality. Specifically, in our case, acting prosocially meant abstaining from a justified reward. Although we can only speculate about the process, we assume that those who are high in exchange orientation tend to monitor the balance of benefits exchanged in order to ensure that equality is maintained (e.g., Murstein et al., 1987). Furthermore, such individuals were shown to be negatively affected when they experienced

inequality (e.g., Buunk et al., 1993; Buunk & Schaufeli, 1999). Therefore, to maintain equality and to avoid negative affects, they acted in favor of exchange equality, and thus refrained from donating their participation fee. Literature on social exchange has suggested that immediate reciprocity is strongly expected among strangers and within one-time interactions rather than within close, communal relationships, such as friendships (e.g., Clark & Mills, 1979; Rook, 1987). Therefore, our findings are restricted to short-term relationships.

Regarding participants who were reminded of their own death, results indicated that dispositional exchange orientation is not a relevant factor in their donation decision: Both types of participants (those who were low as well as those who were high in exchange orientation) were equally likely to donate their participation payment after MS. According to the idea that MS increases motivation to fulfill situationally prescribed norms, participants high in exchange orientation were more likely to donate after MS compared to the DP control condition. Participants who were low in exchange orientation showed no increased donation likelihood after MS. This might be due to a ceiling effect because the donation likelihood for these participants was already high in the DP control condition. According to the findings of Joireman & Duell (2005, 2007) which indicated that MS increased prosocial values of proself- but not prosocial-oriented individuals, one could also speculate that participants who were low in exchange orientation were not affected by MS because they were already living up to culturally prescribed prosocial norms.

Given that MS was recently shown to increase adherence to the norm of reciprocity (Schindler et al., 2012, 2013), one could suggest that MS would cause the likelihood of individuals high in exchange orientation to donate their payment to charity to be less, due to an increased motivation to maintain exchange equality. However, although we did not manipulate norm salience in our experimental setting, we assumed the donation scenario to have constituted a situation where prosocial norms were of high cognitive focus because the charity organization was explicitly introduced as one in support of disadvantaged children.

According to research on cooperation in social dilemmas (e.g., Axelrod, 1984; Fox & Guyer, 1978) which suggested that cooperation decreases when decisions are made anonymously, we further assumed that direct face-to-face interaction is a crucial factor for our findings because it may have further increased prosocial norm salience by inducing normative pressure and social desirability to follow the prosocial request. Interestingly, Jonas et al. (2008, Study 1) found a proself prime to decrease reported willingness to support day-care facilities for children after MS. Moreover, Jonas et al. (2013, Study 1) found MS to decrease the amount of donated money toward an outgroup-focused charity. In this study, participants were told to put their donation amount in an envelope and to drop the envelope in a box. So, in both studies, prosocial behavior was assessed anonymously. Thus, it remains an open question whether MS decreases prosocial behavior after a proself prime when the decision is made publicly. Following this, we believe that the case of anonymity in prosocial behavior is an important and promising, but so far disregarded, issue in TMT research.

In any case, based on our results, we speculate that although individuals who are high in exchange orientation are, in general, motivated to maintain exchange equality, being confronted with their own death increases their motivation to act in favor of the situationally prescribed prosocial norm.

References

Adams, J. S. (1965). Inequity in social exchange. In L. Berkowitz (Ed.), *Advances in Experimental Social Psychology* (Vol.2, pp. 267–299). New York: Academic Press.

Arndt, J., Greenberg, J., & Cook, A. (2002). Mortality salience and the spreading activation of worldview-relevant constructs: Exploring the cognitive architecture of terror management. *Journal of Experimental Psychology: General, 131*, 307–324. DOI:10.1037//0096-3445.131.3.307

Arndt, J., Solomon, S., Kasser, T., & Sheldon, K. M. (2004). The urge to splurge: A terror management account of materialism and consumer behavior. *Journal of Consumer Psychology*, *14*, 198–212.

Axelrod, R. (1984). *The evolution of cooperation.* New York: Basic Books.

Bell, R. A., Abrahams, M. F., Clark, C. L., & Schlatter, C. (1996). The door-in-the-face compliance strategy: An individual differences analysis of two models in an AIDS fundraising context, *Communication Quarterly*, *44*, 107–124. DOI:10.1080/0146337960937000

Blackie, L. E. R., & Cozzolino, P. J. (2011). Of blood and death: A test of dual-existential systems in the context of prosocial intentions. *Psychological Science*, *22*, 998–1000. DOI:10.1177/0956797611415542

Burke, B. L., Martens, A., & Faucher, E. H. (2010). Two decades of terror management theory: A meta-analysis of mortality salience research. *Personality and Social Psychology Review, 14*, 155–195.

Buunk, B. P., Jan Doosje, B., Jans, L. G., & Hopstaken, L. E. (1993). Perceived reciprocity, social support, and stress at work: The role of exchange and communal orientation. *Journal of Personality and Social Psychology*, *65*, 801–811. DOI:10.1037/0022-3514.65.4.801

Buunk, P. B., & Prins, K. S. (1998). Loneliness, exchange orientation, and reciprocity in friendships. *Personal Relationships*, *5*, 1–14. DOI:10.1111/j.1475-6811.1998.tb00156.x

Buunk, P. B., & Schaufeli, W. B. (1999). Reciprocity in interpersonal relationships: An evolutionary perspective on its importance for health and well-being. *European Review of Social Psychology*, *10*, 259 – 291. DOI:10.1080/14792779943000080

Buunk, B. P., & VanYperen, N. W. (1991). Referential comparisons, relational comparisons, and exchange orientation: Their relation to marital satisfaction. *Personality and Social Psychology Bulletin*, *17*, 709–716. DOI:10.1177/0146167291176015

Cialdini, R. B., Green, B. L., & Rusch, A. J. (1992). When tactical pronouncements of change become real change: The case of reciprocal persuasion. *Journal of Personality and Social Psychology*, *63*, 30–40. DOI:10.1037/0022-3514.63.1.30

Cialdini, R. B., Vincent, J. E., Lewis, S. K., Catalan, J., Wheeler, D., & Darby, B. L. (1975). Reciprocal concessions procedure for inducing compliance: The door-in-the-face technique. *Journal of Personality and Social Psychology, 32*, 206–215. DOI:10.1037/h0076284

Clark, M. S., & Mills, J. (1979). Interpersonal attraction in exchange and communal relationships. *Journal of Personality and Social Psychology*, *37*, 12–24. DOI:10.1037/0022-3514.37.1.12

Cropanzano, R., & Mitchell, M. S. (2005). Social Exchange Theory: An interdisciplinary review. *Journal of Management*, *31*, 874–900. DOI:10.1177/0149206305279602

Edlund, J. E., Sagarin, B. J., & Johnson, B. S. (2007). Reciprocity and the belief in a just world. *Personality and Individual Differences, 43*, 589–596. DOI:10.1016/j.paid.2007.01.007

Eisenberger, R., Lynch, P., Aselage, J., & Rohdieck, S. (2004). Who takes the most revenge? Individual differences in negative reciprocity norm endorsement. *Personality and Social Psychology Bulletin*, *30*, 787–799. DOI:10.1177/0146167204264047

Fox, J., & Guyer, M. (1978). Public choice and cooperation in n-person prisoner's dilemma. *Journal of Conflict Resolution*, *22*, 469–481.

Galliot, M. T., Stillman, T. F., Schmeichel, B. J., Maner, J. K., & Plant, E. A. (2008). Mortality salience increases adherence to salient norms and values. *Personality and Social Psychology Bulletin*, *34*, 993–1003.

Gouldner, A. (1960). The norm of reciprocity: A preliminary statement. *Journal of Social and Personal Relationships*, *2*, 351–375. DOI:10.2307/2092623

Greenberg, J., Pyszczynski, T., & Solomon, S. (1986). The cause 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., Solomon, S., & Arndt, J. (2008). A basic but uniquely human motivation: Terror management. In J. Y. Shah, W. L. Gardner (Eds.). *Handbook of motivation science* (pp. 114-134). New York: Guilford Press.

Greenberg, M. S., & Westcott, D. R. (1983). Indebtedness as a mediator of reactions to aid. In J. D. Fisher, A. Nadler, & B. M. DePaulo (Eds.), *New directions in helping behavior* (Vol. 1, pp. 86–112). San Diego, CA: Academic Press.

Hatfield, E., & Sprecher, S. (1983). Equity theory and recipients' reactions to help. In J. D. Fisher, A. Nadler, & B. M. DePaulo (Eds.), *New directions in helping behavior* (Vol. 1, pp. 113–141). San Diego, CA: Academic Press.

Hayes, A. F., & Matthes, J. (2009). Computational procedures for probing interactions in OLS and logistic regression: SPSS and SAS implementations. *Behavior Research Methods*, *41*, 924–936. DOI:10.3758/BRM.41.3.924

Heller, K. A., & Perleth, C. (2000). *Kognitiver Fähigkeitstest für 4.-12. Klassen, Revision (KFT 4–12 + R)* [Cognitive Abilities Test for Grades 4–12, Revision]. Göttingen: Hogrefe.

Hirschberger, G., Ein-Dor, T., & Almakias, S. (2008). The self-protective altruist: Terror management and the ambivalent nature of prosocial behavior. *Personality and Social Psychology Bulletin*, *34*, 666–678. DOI:10.1177/0146167207313933

Joireman, J., & Duell, B. (2005). Mother Teresa versus Ebenezer Scrooge: Mortality salience leads proselfs to endorse self-transcendent values (unless proselfs are reassured). *Personality and Social Psychology Bulletin*, *31*, 307–320. DOI:10.1177/0146167204271593

Joireman, J., & Duell, B. (2007). Self-transcendent values moderate the impact of mortality salience on support for charities. *Personality and Individual Differences*, *43*, 779–789. DOI:10.1016/j.paid.2007.02.003

Jonas, E., Martens, A., Niesta Kayser, D., Fritsche, I., Sullivan, D., & Greenberg, J. (2008). Focus theory of normative conduct and terror management theory: The interactive impact of mortality salience and norm salience on social judgment. *Journal of Personality and Social Psychology*, *95*, 1239–1251. DOI:10.1037/a0013593

Jonas, E., Schimel, J., Greenberg, J., & Pyszczynski, T. (2002). The Scrooge effect: Evidence that mortality salience increases prosocial attitudes and behavior. *Personality and Social Psychology Bulletin*, *28*, 1342–1353. DOI:10.1177/014616702236834

Jonas, E., Sullivan, D., & Greenberg, J. (2013). Generosity, greed, norms, and death – differential effects of mortality salience on charitable behavior. *Journal of Economic Psychology*, *35*, 47–57.

Kasser, T., & Sheldon, K. M. (2000). Of wealth and death: Materialism, mortality salience, and consumption behavior. *Psychological Science*, *11*, 348–351.

LaGaipa, J. J. (1977). Interpersonal attraction and social exchange. In S. Duck (Ed.), *Theory and practice in interpersonal attraction* (pp. 129–164). San Diego, CA: Academic Press.

McGregor, H., Lieberman, J. D., Solomon, S., Greenberg, J., Arndt, J., Simon, L., et al. (1998). Terror management and aggression: Evidence that mortality salience motivates aggression against worldview threatening others. *Journal of Personality and Social Psychology*, *74*, 590–605.

Milardo, R. M., & Murstein, B. I. (1979). The implications of exchange orientation on the dyadic functioning of heterosexual cohabitors. In M. Cook & G. Wilson (Eds.), *Love and attraction: An international conference* (pp. 279–285). Elmsford, NY: Pergamon Press.

Murstein, B. I., Cerreto, M., & MacDonald, M. G. (1977). A theory and investigation of the effect of exchange orientation on marriage and friendship. *Journal of Marriage and the Family*, *39*, 543–548.

Murstein, B. I., Wadlin, R., & Bond, C. F. (1987). The revised exchange-orientation scale. *Small Group Research*, *18*, 212–223. DOI:10.1177/104649648701800205

Perugini, M., Gallucci, M., Presaghi, F., & Ercolani, A. P. (2003). The personal norm of reciprocity. *European Journal of Personality, 17*, 251–283. DOI:10.1002/per.474

Regan, D. (1971). Effects of a favor and liking on compliance. *Journal of Experimental Social Psychology*, *7*, 627–639. DOI:10.1016/0022-1031(71)90025-4

Rook, K. S. (1987). Reciprocity of social exchange and social satisfaction among older women. *Journal of Personality and Social Psychology*, *52*, 145–154. DOI:10.1037/0022-3514.52.1.145

Rosenblatt, A., Greenberg, J., Solomon, S., Pyszczynski, T., & Lyon, D. (1989). Evidence for terror management theory I: The effects of mortality salience on reactions to those

who violate or uphold cultural values. *Journal of Personality and Social Psychology*, *57*, 681–690. DOI:10.1037/0022-3514.57.4.681

Schindler, S., Reinhard, M.-A., & Stahlberg, D. (2012). Mortality salience increases personal relevance of the norm of reciprocity. *Psychological Reports*, *111*, 565–574. DOI:10.2466/20.02.21.PR0.111.5.565-574

Schindler, S., Reinhard, M.-A., & Stahlberg, D. (2013). Tit for tat in the face of death: The effect of mortality salience on reciprocal behavior. *Journal of Experimental Social Psychology*, *49*, 87–92. DOI:10.1016/j.jesp.2012.06.002

Smets, E. M. A., Visser, M. R. M., & Oort, F. J. (2006). Perceived Inequity: Does it explain burnout among medical specialists? *Journal of applied Social Psychology*, *34*, 1900–1918. DOI:10.1111/j.1559-1816.2004.tb02592.x

Thorndike, R. L., & Hagen, E. (1993). *The Cognitive Abilities Test: Form 5*. Itasca, IL: Riverside.

Uehara, E. S. (1995). Reciprocity reconsidered: Gouldner's 'moral norm of reciprocity' and social support. *Journal of Social and Personal Relationships*, *12*, 483–502. DOI:10.1177/0265407595124001

Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology*, *53*, 1063–1070.

Whatley, M. A., Webster, J. M., Smith, R. H., & Rhodes, A. (1999). The effect of a favor on public and private compliance: How internalized is the norm of reciprocity. *Basic and Applied Social Psychology*, *21*, 251–259. DOI:10.1207/S15324834BASP2103_8.

Footnotes

[1] Murstein et al. (1987) published a revised version of their original Exchange-Orientation Scale (Murstein et al., 1977) to correct some weaknesses in construct validity.

[2] Although the scale does not directly capture immediate versus delayed reciprocity, individuals who were high in exchange orientation were shown to expect a more immediate reciprocity in exchanges (Milardo & Murstein, 1979; Murstein et al., 1977, 1987).

[3] At our university, monetary compensation of 5 Euros is usually given in a 5 Euro banknote. Suspecting giving the payment in coins to increase participants' suspicion that the donation scenario is part of the experiment, we therefore decided to use this binary judgment as our dependent variable.

[4] Because we used physical pain as a control group, the PANAS might not have been sensitive enough to pick up mood effects of the MS treatment. However, research on TMT has indicated that compared to neutral control groups (e.g., watching television), no effects on the PANAS occurred after MS (e.g., Greenberg, Arndt, Simon, Pyszczynski, & Solomon, 2000).

Table 1

Logistic Regression Results of Participants' Donation Choice as a Function of Exchange Orientation and Mortality Condition (N=67)

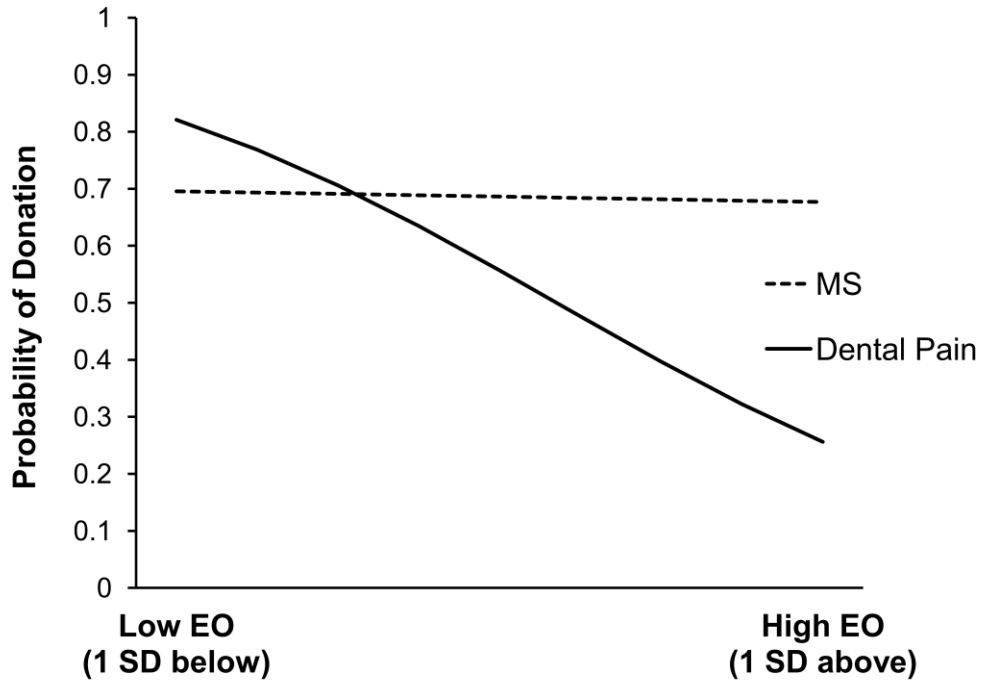
	Model 1[a]	*Model 2*[b]
Model χ^2 (df)	8.631 (2)	12.93 (3)
Statistical significance	.013	.005
Nagelkerkes R^2	.16	.24
Change in χ^2		4.30
Statstical significance of $\Delta\chi^2$		.038

Parameter estimate results following stepwise modeling

		Parameter estimates				*model*	
Model	*Parameter*	*b*	*SE*	*Wald's* χ^2	*p*	$\Delta\chi^2$	*p*
(1)	Exchange Orientation (EO)	-0.68	0.29	5.74	.017	8.63	.013
	Mortality Condition	0.64	0.54	1.44	.230		
(2)	EO x Mortality Condition	1.25	0.63	3.89	.049	4.30	.038

[a]= model 1 consists of the two independent variables (step 1).
[b]= model 2 consists of the two independent variables and the interaction (step 2).

Figure 1. Donation probability of participation payment as a function of participants' exchange orientation and mortality condition.



APPENDIX D

Schindler, S., Pfattheicher, S., & Reinhard, M.-A. (2014). *A hero in the name of truth: Mortality salience increases heroic perceptions of Edward Snowden.* Manuscript submitted for publication.

A Hero in the Name of Truth: Mortality Salience Increases Heroic Perceptions of Edward Snowden

Word Count: 999 words

Number of items (reference list): 15

Abstract

Edward Snowden has made significant personal sacrifices by revealing the truth about secret surveillance activities by the National Security Agency. According to research on terror management theory, reminding people of their own death strengthens worldview-bolstering reactions, such as following cultural standards and supporting people who uphold those standards. Assuming Snowden's disclosures were motivated by fighting for the truth and for the value of honesty, and further that cultural values become more important under mortality salience, we hypothesized that reminding people on their own death increases heroic perceptions of Snowden. In line with this reasoning, results of our study yielded stronger support of Snowden when mortality was salient compared to a control group. This effect was found to be independent of patriotism or political orientation.

Keywords: terror management theory, mortality salience, value of truth, heroism, patriotism

A Hero in the Name of Truth: Mortality Salience Increases Heroic Perceptions of Edward Snowden

The former National Security Agency (NSA) contractor Edward Snowden has become famous worldwide for disclosing top-secret NSA documents containing, among other things, information about global surveillance activities run by the NSA, apparently also including intensive surveillance of Americans (e.g., Risen & Poitras, 2013). According to Snowden, his actions were based on the motivation "to inform the public as to that which is done in their name and that which is done against them" (Greenwald, MacAskill, & Poitras, 2013). As recent polls have indicated, U.S. citizens are divided as to whether Snowden is a hero or a villain—with Republicans showing less support for Snowden than Democrats (e.g., Newport, 2013). Despite being a subject of controversy, it appears that Snowden has made significant personal sacrifices (such as living in exile apart from his family, being accused of breaking the law, giving up his career) for the benefit of others; namely, revealing the truth about surveillance activities by the NSA. Thus, one might claim that he acted in favor of important cultural values, such as honesty and truth.

According to terror management theory (TMT; e.g., Greenberg, Solomon, & Arndt, 2008), culture functions as an anxiety buffer against the ever-present potential terror of death by providing a meaningful, orderly conception of reality that contains a set of norms and values. By living up to those standards, people believe that they are valuable beings in a meaningful reality. Based on this idea, the mortality salience (MS) hypothesis states that reminding people of their mortality should lead them to increase their defenses and bolster their cultural worldview, resulting in derogating those who violate important cultural values (e.g., McGregor et al., 1998) and supporting those who uphold them (e.g., Greenberg et al., 1990; Greenberg, Simon, Pyszczynski, Solomon, & Chatel, 1992). Greenberg et al. (1990), for example, found American participants to show greater affection for a pro-American author

after having been reminded on their own death, whereas an anti-American author was devaluated under MS.

Although results of more than 250 studies revealed strong support of this idea (e.g., Burke, Martens, & Faucher, 2010), research on TMT has so far neglected one of the most important cultural values there is: the value of honesty (i.e., telling the truth; e.g., Bishin, Stevens, & Wilson, 2006; Weber & Ruch, 2012). Building on the assumptions that Edward Snowden's disclosures were motivated by fighting for the truth and for the value of honesty, and that cultural values become more important under MS, we expected MS to increase heroic perceptions of Snowden. As patriotic attitudes and political orientation were shown to affect worldview defending reactions (Pyszczynski, et al., 2006), we included those factors in our investigation. However, assuming honesty to be a cultural value independent of patriotism and political orientation, we did not expect any interaction effects on support of Snowden.

Method

202 U.S. citizens (118 male, 76 female; ages 18–71 years, $M = 33.94$, $SD = 11.95$) participated in our Internet study via Amazon Mechanical Turk (cf. Buhrmester, Kwang, & Gosling, 2011). Of them, we excluded three participants because they guessed our hypothesis and five participants because they did not know whom Edward Snowden was, leaving a total of 194 participants.

First, participants filled out the demographic measures, including one item assessing patriotism and one item assessing political orientation (conservative vs. liberal; e.g., Nail & McGregor, 2009). Next, they were randomly assigned to an MS or a dentist-visit control condition: Participants in the MS (dentist-visit) condition answered two open-ended questions about death (a visit to the dentist; c.f. Jonas et al., 2008). After a standard delay task (i.e., PANAS-X), we assessed whether participants perceived the person Edward Snowden as a hero, using nine items ($\alpha = .96$; e.g., "Edward Snowden is a hero"; "Edward Snowden tells the

truth"; "Edward Snowden is a betrayer"). Participants responded to all nine items on a 9-point Likert-type scale ranging from 1 (*fully disagree*) to 9 (*absolutely agree*).

Results

To test our hypothesis, we used a multiple linear regression analysis with MS, patriotism, and political orientation in the first step, to predict heroic perceptions of Snowden. In a second step, we included the two-way interaction terms of MS × Patriotism and MS × Political Orientation, and the three-way interaction term of MS × Patriotism × Political Orientation. Finally, MS was centered (coded –1 for the dentist condition and 1 for the MS condition), and patriotism and political orientation was z-standardized.

The first model explained 11.8% (10.4% adjusted) of heroic perceptions of Snowden, $F(3, 190) = 8.46$, $p < .001$. In line with our predictions, a significant main effect of MS occurred, $b = .31$, $SE\ b = .13$, $t(190) = 2.30$, $p = .023$, indicating that participants in the MS condition reported stronger heroic perceptions compared to participants in the control group. Additionally, there was a significant main effect of patriotism, $b = –.52$, $SE\ b = .14$, $t(190) = .3.70$, $p < .001$, indicating that heroic perceptions decreased with increasing patriotism. Political orientation was not a significant predictor, $p > .183$. The second model revealed significant main effects of MS, $p = .016$, and patriotism, $p = .002$. No significant effects of political orientation or the interaction terms occurred, all ps > .121.

Discussion

We investigated the idea that heroic perceptions of Edward Snowden are enhanced after reminding people of their own eminent death. Specifically, we assumed that Snowden acted in the name of honesty and truth, which reflect important cultural values. Results of our study yielded support for our hypothesis. Moreover, in line with the assumption that fighting for the truth constitutes a cultural value independent of patriotism and political orientation, we did not find any interaction of those factors with MS on support of Snowden. Research on TMT further suggests salience of cultural norms and values to be crucial for MS guided

reactions (e.g., Schindler, Reinhard, Stahlberg, 2013). From this basis, one might consider other cultural values to be important for the perception of Edward Snowden, such as loyalty towards the employer.

References

Bishin, B. G., Stevens, D., & Wilson, C. (2006). Character counts? Honesty and fairness in election 2000. *Public Opinion Quarterly*, *70*, 235–248.

Buhrmester, M., Kwang, T., & Gosling, S. D. (2011). Amazon's Mechanical Turk A New Source of Inexpensive, Yet High-Quality, Data?. *Perspectives on Psychological Science*, *6*, 3–5.

Burke, B. L., Martens, A., & Faucher, E. H. (2010). Two decades of terror management theory: A meta-analysis of mortality salience research. *Personality and Social Psychology Review, 14*, 155–195.

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., Simon, L., Pyszczynski, T., Solomon, S., & Chatel, D. (1992). Terror management and tolerance: Does mortality salience always intensify negative reactions to others who threaten one's worldview? *Journal of Personality and Social Psychology*, *63*, 2112–220.

Greenberg, J., Solomon, S., & Arndt, J. (2008). A basic but uniquely human motivation: Terror management. In J. Y. Shah, W. L. Gardner (Eds.). *Handbook of motivation science* (pp. 114-134). New York: Guilford Press.

Greenwald, G., MacAskill, E., & Poitras, L. (2013, June 9). Edward Snowden: The whistleblower behind the NSA surveillance revelations. *The Guardian*. Retrieved from http://www.theguardian.com/world/2013/jun/09/edward-snowden-nsa-whistleblower-surveillance

Jonas, E., Martens, A., Niesta, D., Fritsche, I., Sullivan, D., & Greenberg, J. (2008). Focus theory of normative conduct and terror management theory: The interactive impact of

mortality salience and norm salience on social judgment. *Journal of Personality and Social Psychology, 95*, 1239–1251.

McGregor, H. A., Lieberman, J. D., Greenberg, J., Solomon, S., Arndt, J., Simon, L., & Pyszczynski, T. (1998). Terror management and aggression: Evidence that mortality salience motivates aggression against worldview-threatening others. *Journal of Personality and Social Psychology, 74*, 590–605.

Nail, P., & McGregor, I. (2009). Conservative shift among liberals and conservatives following 9/11/01. *Social Justice Research*, *22*, 231–240.

Newport, F. (2013, June 12). Americans disapprove of government surveillance programs. *Gallup.* Retrieved from http://www.gallup.com/poll/163043/americans-disapprove-government-surveillance-programs.aspx

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*, 525–537.

Risen, N., & Poitras, L. (2013, November 22). N.S.A. Report Outlined Goals for More Power. *The New York Times.* Retrieved from http://www.nytimes.com/2013/11/23/us/politics/nsa-report-outlined-goals-for-more-power.html?pagewanted=all

Schindler, S., Reinhard, M.-A., & Stahlberg, D. (2013). Tit for tat in the face of death: The effect of mortality salience on reciprocal behavior. *Journal of Experimental Social Psychology*, *49*, 87–92.

Weber, M., & Ruch, W. (2012). The role of character strengths in adolescent romantic relationships: An initial study on partner selection and mates' life satisfaction. *Journal of Adolescence*, *35*, 1537–1546.

APPENDIX E

Schindler, S., & Reinhard, M.-A. (2014). *Increasing scepticism towards potential liars: Effects of existential threat and value priming on veracity judgments.* Manuscript submitted for publication.

Increasing Scepticism Towards Potential Liars: Exploring Effects of Existential Threat and Value Priming on Veracity Judgments

Word Count: 6789

Abstract

In two experiments, we investigated effects of mortality salience on veracity judgments. According to several meta-analyses, people judge potentially deceptive messages of other people as true rather than as false (so-called truth bias). Given that research on terror management theory has found evidence that mortality salience increases people's need for salient cultural norms and values to be fulfilled, we predicted that mortality salience (versus control group) increases people's criticism toward other people's messages when they are primed with the value of honesty. This should further lead to a reduced truth bias, resulting in better detection accuracy of actual lies and worse accuracy of actual true statements. In both studies, we manipulated mortality salience and value salience before participants watched and judged several videos containing actual truths or lies. Results revealed evidence for our predictions, indicating that mortality salience and value salience play important roles when the truth is at stake.

Keywords: terror management theory, mortality salience, veracity judgments, judgmental bias, value of honesty.

Increasing Scepticism Towards Potential Liars: Exploring Effects of Existential Threat and Value Priming on Veracity Judgments

As a consequence of the 9/11 terror attacks, President George W. Bush proclaimed the "War on Terror." In addition to al-Qaeda, this military campaign was also targeted toward Saddam Hussein and Iraq because they were assumed by the U.S. government to possess weapons of mass destruction. In their speeches, Secretary of State Colin Powell and President Bush assured the existence of such weapons, leading most Americans to support the war against Iraq (Gallup & Newport, 2004). However, investigations of a task force did not result in compliance with this argument (Duelfer, 2004): No weapons of mass destruction were found. Consequently, one third of Americans (Gallup & Newport, 2004) and some authors imputed deliberate deception to President Bush (e.g., Corn, 2004). Whether their accusation holds true or not, this incident clearly illustrates the importance of investigating the effects of existential threats (e.g., 9/11 attacks) on the attribution of credibility as well as on deception detection. By referring to findings on terror management theory (TMT; Greenberg, Pyszczynski, & Solomon, 1986), we assumed that an existential threat would affect the veracity judgments on potentially deceptive messages, depending on which social value is momentarily salient. Specifically, we predicted that priming the value of honesty should lead to a more critical attitude under mortality salience (MS), particularly resulting in increased detection accuracy when judging actual lies.

Research on TMT and the Role of Social Norms and Values

According to TMT (Greenberg et al., 1986), cultural worldviews function as an anxiety buffer against the ever-present terror of potential death, by providing a meaningful, orderly conception of reality that contains a set of standards and values. By living up to those cultural standards, people are enabled to believe that they are valuable beings in a meaningful reality. Based on this idea, the mortality salience (MS) hypothesis states that reminding

people of their mortality should lead to an increased need for the protection provided by such worldview-based beliefs: People want others to correspond to their own cultural worldview, resulting, for example, in derogating those who violate important cultural standards and supporting those who uphold them (for an overview, see Greenberg, Solomon, & Arndt, 2008).

As cultural standards can, however, be contradictory, resulting in a mixed pattern of behaviors (e.g., aggression vs. helpfulness), Jonas et al. (2008) connected TMT with the focus theory of normative conduct (Cialdini, Kallgren, & Reno, 1991), stating that norms have to be salient in attention or high in accessibility to influence behavior (see also Higgins & Bargh, 1987). This may be because people habitually follow a norm and/or because certain conditions of the situation itself account for the norm's salience. In line with this reasoning, MS was found to increase adherence to a broad range of activated norms and values, such as prosocial and proself norms, pacifism and conservatism (Jonas et al., 2008), egalitarianism and helpfulness (Gailliot, Stillman, Schmeichel, Maner, & Plant, 2008, Schindler, Reinhard, Stahlberg, & Len, in press), proenvironmental norms (Fritsche, Jonas, Kayser, & Koranyi, 2010), norms of fairness (Jonas & Greenberg, 2012), and the norm of reciprocity (Schindler, Reinhard, Stahlberg, 2012, 2013). In sum, this line of research clearly supports the influence of salient norms and values when reminding people of their own mortality.

Despite the huge amount of TMT research on worldview defense and norm adherence, to our knowledge, no empirical investigations have been done on the value of honesty. This seems the more astonishing if one takes into account that surveys indicated honesty to be one of the most important values in people's lives in general (e.g., Geißler, Schöpe, Klewes, Rauh & von Alemann, 2013), and specifically, for example, in romantic relationships (Weber & Ruch, 2012) and politics (Bishin, Stevens, & Wilson, 2006).

Although literature mentions honesty as an evolutionarily developed form of social capital that can be accumulated (e.g., Somanathan & Rubin, 2004), for the current work, we refer to honesty as a norm; namely, that one should tell the truth and should not lie. Given that salient social norms and values play an important role in TMT (Jonas et al., 2008), we assume the value of honesty to moderate effects of MS on judging the deceptive behavior of others.

Veracity Judgments and Truth Bias

Although lying has always been a social issue (Ekman, 1992), people's ability to discriminate accurately between lies and truths is not particularly well developed. In a comprehensive meta-analysis of more than 200 studies, Bond and DePaulo (2006) found that people without special training were slightly better than the chance result of a coin toss (54%) when judging the veracity of actual true or deceptive statements (for similar results see; Aamodt & Custer, 2006; Ekman & O'Sullivan, 1991; Hartwig & Bond, 2011). Besides discrimination accuracy, Bond and DePaulo additionally found that people were better at correctly identifying truths as nondeceptive (61%) than they were at identifying lies as deceptive (47%; so-called veracity effect). Based on parallel findings of his meta-analysis, Vrij (2000) asserted that analyzing accuracy at detecting actual lies separately from detecting actual truths revealed "that people are particularly poor at detecting lies" (Vrij, 2000, p. 240). This result is due to people's general tendency to judge messages as true (so-called *truth bias*): Bond and DePaulo's analysis of percentage truth classifications revealed a mean of about 57%, which differed significantly from 50%, supporting the truth bias. Thus, when people are truth biased, that is, when they more frequently judge messages as true rather than as false, logically, they are likely to be better at correctly judging actual truths than lies (e.g., Levine, Kim, & Blair, 2010; Zuckerman, DeFrank, Hall, Larrance, & Rosenthal, 1979). In

contrast, overall-discrimination accuracy was found to be unrelated to the truth bias (Bond & DePaulo, 2006; Hartwig & Bond, 2011).

Literature attributes the truth bias to the phenomenon whereby in daily communications, people usually believe messages from other people without questioning honesty (e.g., Levine et al., 2010). Research has shown the truth bias to be increased, for example, in face-to-face interactions (Buller, Strzyzewski, & Hunsaker, 1991) or in close relationships (McCornack & Parks, 1986). Moreover, truth bias in close relationships has been shown to decrease when there are contextual cues for suspicion (McCornack & Levine, 1990), that is, when beliefs about communicative honesty are questioned. Extending this line of research, with the current work we address motivational aspects of the truth bias and the related detection accuracy by investigating effects of existential threat (i.e., MS).

The Present Research

To investigate the issue of existential threat and the process of deception detection, we used TMT to derive our hypotheses. Given that findings on TMT suggest that MS increases people's need for salient cultural norms and values to be fulfilled (e.g., Jonas et al., 2008), we assumed that by priming people with the value of honesty, MS would increase state suspicion (McCornack & Levine, 1990) and, consequently, criticism toward other people's messages. Thus, we hypothesized that when priming the value of honesty, MS (vs. control group) should lead to a reduced truth bias, resulting in better detection accuracy of actual lies and in worse detection accuracy of actual true messages. Notably, we did not predict an overall accuracy effect meaning that people under MS get in general better discriminating true statements from lies. In both studies, we manipulated MS and value salience before participants watched and judged several different sets of videos containing actual true or false messages. In Study 1 (online study), we used a no-prime control condition, whereas in Study

2, a group solidarity value-prime condition was included, assuming an increased truth-bias under MS, resulting in worse (better) detection accuracy of actual deceptive (true) messages.

Study 1

In this online study, participants had to judge the veracity of several videos in which other people talk about movies or series they ostensibly like or dislike. For participants who read a short statement about the socially important value of honesty, we assumed MS (vs. control group) to increase suspicion and criticism towards the messages. This should result in judging the messages less frequently as true what should consequently lead to better detection accuracy when judging actual lies and to worse detection accuracy when judging actual true statements. In the no-value prime control condition no effect was expected.

Method

Subjects and design. We calculated the sample size to obtain sufficient power to detect both the two-way interaction on the judgmental bias and the three-way interaction on detection accuracy (80% to detect an effect if one exists; Cohen, 1988). Power analysis assuming an effect of the predicted three-way interaction on detection accuracy of = .20 (cf. Reinhard & Schwarz, 2012) and a small correlation between the dependent variables, revealed an N of 120. Given the possibility of easily obtaining large samples through Internet experiments (Reips, 2002), participants in this Internet study were 156 German people (116 women; M_{age} = 21.67, SD = 2.24). The design was a 2 × 2 × 2 mixed model design with salience (MS vs. TV control condition) and value priming (honesty vs. no priming control condition) as between-participants variables, and type of message (lie vs. truth) as within-participants variable.

Procedure and measures. After the demographic measures, participants received the MS or TV control treatment (see e.g., Jonas et al., 2008): They were asked to write down the first sentence that came to their mind when they thought about their own death (MS

condition) or about watching TV (control condition). When using such explicit death primes, a distractor is necessary to elicit effects of worldview defense and bolstering (Arndt, Greenberg, & Cook, 2002). Therefore, as in many studies on TMT (Burke, Martens, & Faucher, 2010), participants filled out the Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988).[1] Next, participants in the honesty priming condition read a short statement about the fundamental importance for society's stability to follow the value of honesty. In the no priming control condition, this statement did not occur. Then, participants were instructed that they would watch twenty-four messages of students describing movies they really liked or disliked, and that some of these messages were in fact true, as the reporting students did like or dislike the movie (for detailed description of the material see Reinhard & Schwarz, 2012, Study 2). They were also told that some of these messages were not true, as the students described a movie they liked (disliked) as though they disliked (liked) it. Participants were further told to put themselves in the position of the person who interviewed the students about their attitudes. Each participant was presented one of the three sets of twenty-four messages. Then they saw each of the twenty-four messages, and immediately after watching each message participants had to classify it as a lie or the truth. After having judged all messages, participants were thanked and debriefed.

Results

Truth bias. We conducted a 2 (Salience: MS vs. TV control condition) × 2 (Priming: honesty vs. no priming control condition) analysis of variance (ANOVA), with the number of messages judged true (in %) as the dependent variable. Overall, participants classified 53.39% (SD = 10.19) of the messages as true. This value is significantly different from 50%, $t(155) = 4.16$, $p < .001$. Results of the ANOVA revealed no main effects, both Fs < 1. However, as predictd, a significant interaction effect of salience and priming condition occurred, $F(1, 152) = 5.01$, $p = .027$, $\eta^2_p = .03$.[2] As expected, when participants were primed

with the value of honesty, percentages of messages judged true were not significantly different from 50% in the MS condition (M = 51.46%, SD = 9.69), $t(39) = 0.95$, $p = .347$, whereas a truth bias still occurred in the TV control condition (M = 54.90%, SD = 9.62), $t(39) = 3.22$, $p = .003$ (see Figure 1). Although these results are in line with our hypotheses, simple effects analyses revealed that percentages of messages judged true in the honesty priming condition were not significantly lower in the MS condition compared to the TV control condition, $F(1, 152) = 2.31$, $p = .131$. Additionally, and in line with our argument that activating the value of honesty should be responsible for this effect, the truth bias still occurred under MS in the no priming control condition (M = 55.86%, SD = 9.34), $t(31) = 3.55$, $p = .001$. Again, simple effects analyses revealed that percentages of messages judged true in the MS condition were lower in the honesty priming condition compared to the no priming control condition only by trend, $F(1, 152) = 2.71$, $p = .102$. Unexpectedly, when participants had not been primed with the value of honesty, percentages of messages judged true failed to be significantly different from 50% in the TV control condition (M = 51.99 %, SD = 11.42), $t(43) = 1.156$, $p = .254$.

Detection accuracy. We conducted a 2 (Salience: MS vs. TV control condition) × 2 (Value priming: honesty vs. no priming control condition) × 2 (Type of message: Lie vs. Truth) mixed-model design ANOVA, with detection accuracy (in %) as the dependent variable. Salience and value priming were between-participants variables, and type of message was a within-participants variable.

Overall, the mean percentage of correct lie-truth classifications was 56.22% (SD = 11.53). On average, participants were significantly better than chance in their lie-truth classifications, $t(155) = 6.74$, $p < .001$. Results of the mixed-model design ANOVA revealed a main effect of the type of message, indicating that participants were better at classifying truthful messages as actually true (M = 59.62%, SD = 13.82) than they were at classifying

deceptive messages as actual lies (M = 52.83%, SD = 16.81), $F(1, 152) = 18.92$, $p < .001$, $\eta^2_p = .11$ (veracity effect). Furthermore, the predicted three-way interaction between salience and value priming and type of message occurred, $F(1, 152) = 5.01$, $p = .027$, $\eta^2_p = .03$. Simple effects analyses for detection accuracy for actual lies within the honesty priming condition revealed that participants under MS were better (M = 57.50%, SD = 13.84) compared to the TV control condition (M = 49.38%, SD = 19.92), $F(1, 152) = 6.44$, $p = .012$, $d = .47$. Simple effects within the no priming control condition indicated no significant difference between the MS (M = 49.22%, SD = 14.72) and the TV control condition (M = 54.36%, SD = 16.91), $p = .125$. Additionally, and in line with our argument that activating the value of honesty should be responsible for this effect, simple effects within the MS condition showed that participants in the honesty priming condition were also better at detecting actual lies (M = 57.50%) than participants in the no priming control condition (M = 49.22%), $F(1, 152) = 5.95$, $p = .016$, $d = .58$. Regarding detection accuracy for actual true messages, no effects occurred (accuracy ranged from 58.33 to 60.94%), all Fs < 1.

Mediation of lie detection accuracy. The regression analyses supported the hypothesized mediational effect of percentage of messages judged true on detection accuracy of actual lies. The interaction of Salience (TV control condition = –1, MS condition = 1) × Priming (no priming condition = –1, honesty priming condition = 1) predicted detection accuracy of actual lies in step one, $b = 3.32$, $SE\ b = 1.34$, $t(152) = 2.48$, $p = .014$, and percentage of messages judged true in step two, $b = –1.83$, $SE\ b = 0.82$, $t(152) = –2.24$, $p = .027$. In step three, the percentage of messages judged true predicted participants' detection accuracy, $b = –1.22$, $SE\ b = 0.09$, $t(154) = –13.65$, $p < .001$. In step four, the direct effect of the Salience × Priming interaction on detection accuracy of actual lies was reduced to nonsignificance when accuracy was regressed on the interaction and percentage of messages judged true, $b = 1.12$, $SE\ b = 0.93$, $t(151) = 1.21$, $p = .230$. Sobel's test indicated that the

indirect effect of the two-way interaction on detection accuracy of actual lies via percentage of messages judged true was significantly different from zero, $z = 2.20$, $p = .028$. Additionally, bootstrapping the proposed mediation (using the Process macro of Hayes, 2013, and 5000 samples) also revealed significant results, that is, the 95% confidence interval did not include zero [0.77, 8.24].

Discussion

Results of this study support our hypothesis that when people are primed with the value of honesty, existential threat increases people's scepticism towards potentially deceptive messages of others: Participants who read a statement about the importance of honesty judged about 52% as true under MS, compared to about 55% in the TV and 56% in the value priming control conditions, respectively. Moreover, participants who read a statement about the importance of honesty were better at judging actual lies under MS (about 58%), compared to about 49% in the TV and the value priming control conditions, respectively. In line with our predictions, these effects were fully mediated by percentage of messages judged true. Surprisingly, we found no effects on actually true messages (see General Discussion).

Study 2

To bolster up the findings of Study 1, we designed a laboratory study applying video material which contained true or false messages of students who had been interviewed about having cheated in a test. Parallel to Study 1, we assumed that participants who read a statement about the important value of honesty should react with increased suspicion and criticism towards the messages under MS (vs. control group). Again, this should result in judging the messages less frequently as true what should consequently lead to better (worse) detection accuracy when judging actual deceptive (true) messages. Additionally, in contrast to the no priming control condition in Study 1, we included a solidarity-value priming

condition, expecting opposite effects on truth bias compared to priming the value of honesty. According to research on TMT, group membership and social identity plays a significant role when being confronted with one's own death: Empirical evidence demonstrates existential threat to enhance striving for togetherness and group attachment (e.g., Mikulincer, Florian & Hirschberger, 2003), in-group favoritism (e.g., Harmon-Jones et al., 1996; Jonas, Schimel, Greenberg, & Pyszczynski, 2002) and out-group derogation (e.g., Fritsche et al., 2008; Greenberg et al., 1990). We, therefore, assumed pronouncing the value of group solidarity under MS to reduce suspicion towards potentially deceptive messages of students, leading to increased truth-bias. This should further result in worse (better) detection accuracy of actual deceptive (true) messages. In sum, in line with research on TMT (e.g., Jonas et al., 2008), we predict MS effects on judgmental bias to depend on what value for one's group is cognitively focussed (i.e., honesty vs. solidarity).

Method

Subjects and design. We calculated the sample size to obtain sufficient power to detect both the two-way interaction on the judgmental bias and the three-way interaction on detection accuracy. Power analysis assuming a medium effect of the predicted three-way interaction of f = .25 (cf. Marksteiner, 2013) and a small correlation between the dependent variables, revealed an *N* of 78. Participants in this study included 81 students (46 women) recruited on the campus of a German university (M_{age} = 22.90, *SD* = 2.45). The design was a 2 × 2 × 2 mixed model design, with salience (MS vs. dental pain control condition) and value priming (honesty vs. solidarity) as between-participants variables, and type of message (lie vs. truth) as a within-participants variable.

Procedure and measures. After the demographic measures, participants in the MS condition answered two open-ended questions about death, whereas participants in the control condition answered two open-ended questions about dental pain (e.g., Rosenblatt,

Greenberg, Solomon, Pyszczynski, & Lyon, 1989). Then, they filled out the PANAS. Next, participants in the honesty priming condition read an alleged excerpt from the university's code of ethics in which the value of honesty and the responsibility of every student to uncover academic misbehavior were pronounced. In contrast, in the solidarity priming condition, the value of cohesion and the responsibility of every student to contribute to a companionate togetherness without jealousy were pronounced. Afterward, participants were instructed to watch eight messages of students being interviewed about being accused of having cheated on a test, due to their excellent performance. To produce this stimulus material, in the cheating condition, students had been persuaded by a confederate to use forbidden additives (e.g., calculator) after the attendant had left the room to answer an alleged phone call. Participants were told that all students pretended to have not been cheating and that some of these messages were, in fact, true. Additionally, they were informed that some of these messages were not true because some of the students pretended to have not been cheating even though they did cheat (for a similar procedure, see Exline, Thibaut, Hickey, & Gumpert, 1970). Each participant was presented with one of three sets of eight messages, and immediately after watching each message, participants had to classify it as either a lie or truth. Finally, participants were thanked, paid, and debriefed.

Results

Truth bias. Overall, participants classified 59.9% (SD = 14.62) of the messages as true. This value is significantly different from 50%, $t(80) = 6.08$, $p < .001$. Results of the 2 (Salience: MS vs. dental pain control condition) × 2 (Value priming: honesty vs. solidarity) ANOVA on number of messages judged true (in %) revealed no main effects, both Fs < 1. However, as predicted, a significant interaction effect of salience and priming condition occurred, $F(1, 77) = 4.87$, $p = .030$, $\eta^2_p = .06$. As expected, when participants were primed with the value of honesty, percentages of messages judged true were not significantly

different from 50% in the MS condition (M = 55.00%, SD = 14.85), $t(19) = 1.51$, $p = .148$, whereas the truth bias occurred in the dental pain control condition (M = 62.50%, SD = 14.62), $t(19) = 3.82$, $p = .001$ (see Figure 2). Although these results are in line with our hypotheses, simple effects analyses revealed that percentages of messages judged true in the honesty priming condition were not significantly lower in the MS condition compared to the dental pain control condition, $F(1, 77) = 2.71$, $p = .104$. Furthermore, percentages of messages judged true in the solidarity priming condition were significantly different from 50% in the MS condition, (M = 64.38%, SD = 15.85), $t(19) = 4.06$, $p < .001$, as well as in the dental pain control condition, (M = 57.74%, SD = 12.17), $t(20) = 2.91$, $p = .009$. Again, simple effects analyses revealed that percentages judged true in the solidarity priming condition were not significantly higher in the MS condition compared to the dental pain control condition, $F(1, 77) = 2.17$, $p = .144$. Additionally, simple effects analyses revealed that percentages of messages judged true in the MS condition were lower in the honesty priming condition compared to the solidarity priming condition, $F(1, 77) = 4.23$, $p = .043$, d = .61. No difference of value activation occurred within the dental pain control condition, p = .294.

Detection accuracy. Overall, the mean percentage of correct lie-truth classifications was 50.62% (SD = 16.76). On average, participants were not better than chance in their lie-truth classifications, $t < 1$. Results of the mixed-model design 2 (Salience: MS vs. TV control condition) × 2 (Value priming: honesty vs. no priming control condition) × 2 (Type of message: lie vs. truth) ANOVA on detection accuracy (in %) revealed a main effect of the type of message, indicating that participants were better at classifying actual truthful messages as true (M = 60.49%, SD = 20.87) than they were at classifying actual deceptive messages as lies (M = 40.74%, SD = 23.53), $F(1, 77) = 38.25$, $p < .001$, $\eta^2_p = .33$ (veracity effect). Most importantly, however, the ANOVA yielded the predicted three-way interaction,

$F(1, 77) = 4.87$, $p = .030$, $\eta^2_p = .06$. Simple effects analyses for detection accuracy for actual lies within the honesty priming condition revealed that participants under MS were better ($M = 47.50\%$, $SD = 26.78$) compared to the dental pain control condition ($M = 36.25\%$, $SD = 23.61$), $F(1, 77) = 3.05$, $p = .085$, $d = .45$. In contrast, simple effects within the solidarity priming control condition indicated that participants under MS were worse ($M = 33.75\%$, $SD = 18.63$) than in the dental pain control condition ($M = 45.24\%$, $SD = 23.21$), $F(1, 77) = 3.26$, $p = .075$, $d = .54$. Additionally, and in line with our argument that activating different values should be responsible for this effect, simple effects within the MS condition showed that participants in the honesty priming condition were also better at detecting actual lies ($M = 47.50\%$) than were participants in the solidarity priming condition ($M = 33.75\%$), $F(1, 77) = 4.55$, $p = .036$, $d = .60$. No difference of value activation occurred within the dental pain control condition, $p = .166$. Regarding detection accuracy for actual true messages, no effects occurred (accuracy ranged from 57.50 to 62.50 %), all Fs < 1.

Mediation of detection accuracy. The regression analyses supported the hypothesized mediational effect of the percentage of messages judged true on detection accuracy of actual lies. The interaction of Salience (dental pain control condition = –1, MS condition = 1) × Priming (solidarity = –1, honesty = 1) predicted detection accuracy of actual lies in step one, $b = 5.69$, $SE\ b = 2.58$, $t(77) = 2.20$, $p = .031$, and the percentage of messages judged true in step two, $b = –3.53$, $SE\ b = 1.60$, $t(77) = –2.21$, $p = .030$. In step three, the percentage of messages judged true predicted participants' detection accuracy, $b = –1.14$, $SE\ b = 0.13$, $t(77) = –8.89$, $p < .001$. In step four, the direct effect of the Salience × Priming interaction on detection accuracy of actual lies was reduced to nonsignificance when accuracy was regressed on the interaction and the percentage of messages judged true, $b = 1.76$, $SE\ b = 1.95$, $t(77) = 0.91$, $p = .368$. Sobel's test indicated that the indirect effect of the two-way interaction on detection accuracy of actual lies via the percentage of messages

judged true was significantly different from zero, $z = 2.14$, $p = .03$. Additionally, bootstrapping the proposed mediation (using the Process macro of Hayes, 2013, and 5000 samples) also revealed significant results, that is, the 95% confidence interval did not include zero [0.98, 15.90].

Discussion

Results of this study show additional support for our hypothesis that when people are primed with the value of honesty, existential threat increases people's scepticism towards potentially deceptive messages of others: Participants who read a statement about the importance of honesty judged about 55% as true under MS, compared to about 63% in the dental pain control condition and 64% in the solidarity value priming conditions, respectively. Moreover, and parallel to findings in Study 1, participants who read a statement about the importance of honesty were better at judging actual lies under MS (about 48%), compared to the dental pain control condition (about 36%) and to the solidarity value priming condition (about 34%), respectively. Furthermore, when participants were primed with the value of solidarity, they were worse at judging actual lies under MS (about 34%), compared to the dental pain control condition (about 45%). In line with our predictions, these effects were fully mediated by percentage of messages judged true. Unexpectedly, as in Study 1, no effects on actual true messages occurred.

General Discussion

The current studies addressed the societally important issue of existential threat on veracity judgments. By referring to research on TMT (e.g., Jonas et al., 2008, Schindler et al., 2013) which has indicated that MS increases people's need for salient cultural norms and values to be fulfilled, in both studies, we predicted and found evidence for the idea that when the value of honesty is salient, MS leads to more suspicion (i.e., reduced truth bias) and, consequently, to better detection accuracy regarding actual lies. Additionally, Study 2

revealed that priming the value of group solidarity can lead to decreased suspicion resulting in worse detection accuracy of actual lies when being reminded of their own death. Regarding the well-supported idea that MS increases striving for togetherness and group attachment (e.g., Mikulincer et al., 2003), in-group favoritism (e.g., Harmon-Jones et al., 1996) and out-group derogation (e.g., Fritsche et al., 2008), it seems plausible that pronouncing solidarity as an important value of one's group decreases criticism toward potentially deceptive messages of ingroup members. Based on this notion, future research should address the question whether MS affects veracity judgments depending on judging statements of in- or outgroup members. Given that MS leads to worldview defending reactions (e.g., Rosenblatt et al., 1989), it seems plausible that statements of outgroup members are judged more critically, probably leading to a lie-bias.

Looking at actual true messages, we predicted priming honesty and MS to reduce accuracy, due to an increased truth bias (e.g., Levine et al., 2010). However—despite the existent effects in truth bias—in both studies, accuracy on actual true messages remained unaffected by MS and value priming, indicating that variations in truth bias does not affect variations in detection accuracy of lies and truths to the same degree. We speculate that this can be ascribed to the fact that the percentage of messages judged true were only moderately reduced and did not fall below the 50% level (i.e., there was no lie-bias; see also McCornack & Levine, 1990). Furthermore, it should be mentioned that the truth bias found in experimental settings (where people are forced to make a judgment) is likely to be underestimated compared to interactions outside the lab (Bond & DePaulo, 2006).

Although our findings indeed show existential threat to affect truth bias and detection accuracy of actual lies, we did not find any support for effects on actual detection skills, as this would imply higher accuracy rates for detecting lies and truths as well. Research provided strong evidence that improved detection skills especially relate to the use of verbal

information which requires a certain degree of motivation and capacity (Reinhard, 2010; Reinhard, Sporer, Scharmach, & Marksteiner, 2011; Reinhard, Greifeneder, & Scharmach, 2013; Reinhard & Schwarz, 2012). Thus, it seems not implausible that there are circumstances in which MS leads to increased detection skills.

Returning to the political incident mentioned at the beginning of the introduction, our findings appear especially interesting in cases of existential threats, such as the events of 9/11, as it seems likely that political leaders pronounce values of solidarity. According to our results, this might result in less suspicion towards the sender's messages, whereas pronouncing the value of honesty instead might lead to a higher probability of increasing scepticism.

Summarized, the present research contributes to the existing literature mainly in three ways: First of all, to our knowledge, no research has so far been done on the effects of existential threat on veracity judgments. Second, despite the large amount of research on the role of social norms and values in TMT, the value of honesty has been neglected so far. And third, by combining TMT and research on veracity judgements, we extend knowledge on motivational aspects of the truth-bias.

References

Aamodt, M. G., & Custer, H. (2006). Who can best catch a liar? A meta-analysis of individual differences in detecting deception. *Forensic Examiner*, *15*, 6–11.

Arndt, J., Greenberg, J., & Cook, A. (2002). Mortality salience and the spreading activation of worldview-relevant constructs: Exploring the cognitive architecture of terror management. *Journal of Experimental Psychology: General*, *131*, 307–324.

Bishin, B. G., Stevens, D., & Wilson, C. (2006). Character counts? Honesty and fairness in election 2000. *Public Opinion Quarterly*, *70*, 235–248.

Bond, C. F., Jr., & DePaulo, B. M. (2006). Accuracy of deception judgments. *Personality and Social Psychology Review*, *10*, 214–234.

Buller, D. B., Strzyzewski, K. D., & Hunsaker, F. G. (1991). Interpersonal deception II: The inferiority of conversational participants as deception detectors. *Communication Monographs*, *58*, 25–40.

Burke, B. L., Martens, A., & Faucher, E. H. (2010). Two decades of terror management theory: A meta-analysis of mortality salience research. *Personality and Social Psychology Review*, *14*, 155–195.

Cialdini, R. B., Kallgren, C. A., & Reno, R. R. (1991). A focus theory of normative conduct: A theoretical refinement and reevaluation of the role of norms in human behavior. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 24, pp. 201–234). San Diego, CA: Academic Press.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences.* Hillsdale, New Jersey: Lawrence Erlbaum Associates.

Corn, D. (2004). *The lies of George W. Bush: Mastering the politics of deception.* Random House Digital, Inc.

Duelfer, C. (2004). *Comprehensive report of the special advisor to the DCI on Iraq's WMD.* Executive Agency Publications.

Ekman, P. (1992). *Telling lies: Clues to deceit in the marketplace, politics, and marriage.* New York: Norton.

Ekman, P., & O'Sullivan, M. (1991). Who can catch a liar? *American Psychologist*, *46*, 913–920.

Exline, R.V., Thibaut, J., Hickey, C. P., & Gumpert, P. (1970). Visual interaction in relation to Machiavellianism and an unethical act (pp. 53–75). In R. Christie & F. L. Geis (Eds.), *Studies in Machiavellianism*. New York: Academic Press.

Fritsche, I., Jonas, E., & Fankhänel, T. (2008). The role of control motivation in mortality salience effects on ingroup support and defense. *Journal of Personality and Social Psychology, 95,* 524–541.

Fritsche, I., Jonas, E., Kayser, D. N., & Koranyi, N. (2010). Existential threat and compliance with pro-environmental norms. *Journal of Environmental Psychology*, *30*, 67–79.

Gailliot, M. T., Stillman, T. F., Schmeichel, B. J., Maner, J. K., & Plant, E. A. (2008). Mortality salience increases adherence to salient norms and values. *Personality and Social Psychology Bulletin*, *34*, 993–1003.

Gallup, A., & Newport, F. (2004). *The Gallup Poll. Public opinion 2003.* Scholarly Resources.

Geißler, H., Schöpe, S., Klewes, J., Rauh, C., & von Alemann, U. (2013). Wertestudie 2013: Wie groß ist die Kluft zwischen dem Volk und seinen Vertretern? Köln: YouGov.

Greenberg, J., Pyszczynski, T., & Solomon, S. (1986). The cause 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., Solomon, S., & Arndt, J. (2008). A basic but uniquely human motivation: Terror management. In J. Y. Shah, W. L. Gardner (Eds.). *Handbook of motivation science* (pp. 114–134). New York: Guilford Press.

Greenberg, J., Solomon, S., Veeder, M., Pyszczynski, T., Rosenblatt, A., Kirkland, S., & Lyon, D. (1990). Evidence for terror management theory II: The effects of mortality salience on reactions to those who threaten or bolster the cultural world view. *Journal of Personality and Social Psychology, 58,* 308–318.

Harmon-Jones, E., Greenberg, J., Solomon, S., & Simon, L. (1996). The effects of mortality salience on intergroup bias between minimal groups. *European Journal of Social Psychology, 26,* 677–681.

Hartwig, M., & Bond, C. F. (2011). Why do lie-catchers fail? A lens model meta-analysis of human lie judgments. *Psychological Bulletin*, *137*, 643–659. doi:10.1037/a0023589

Hayes, A. F. (2013). *Introduction to mediation, moderation, and conditional process analysis.* New York, NY: Guilford.

Higgins, E.T., & Bargh, J. E. (1987). Social cognition and social perception. *Annual Review of Psychology*, *38*, 369–425.

Jonas, E., & Greenberg, J. (2012). Generosity, greed, norms, and death – Differential effects of mortality salience on charitable behavior. *Journal of Economic Psychology*, *35*, 47–57.

Jonas, E., Martens, A., Niesta, D., Fritsche, I., Sullivan, D., & Greenberg, J. (2008). Focus theory of normative conduct and terror management theory: The interactive impact of mortality salience and norm salience on social judgment. *Journal of Personality and Social Psychology*, *95*, 1239–1251.

Levine, T. R., Kim, R. K., & Blair, J. P. (2010). (In) accuracy at detecting true and false confessions and denials: An initial test of a projected motive model of veracity judgments. *Human Communication Research*, *36*, 82–102.

Marksteiner, T. (2013). *Verzerrte Glaubwürdigkeitsbeurteilung im Schulkontext: Effekt unbewusster Urteilsziele und des Verarbeitungsmodus auf die Glaubwürdigkeitsbeurteilung von Schülerinnen und Schülern* (Unpublished doctoral dissertation thesis). University of Mannheim, Mannheim.

McCornack, S. A., & Levine, T. R. (1990). When lovers become leery: The relationship between suspicion and accuracy in detecting deception. *Communication Monographs*, *57*, 219–230.

McCornack, S. A., & Parks, M. R. (1986). Deception detection and relationship development: The other side of trust. *Communication Yearbook*, *9*, 377–389.

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.

Reinhard, M.-A. (2010). Need for cognition and the process of lie detection. *Journal of Experimental Social Psychology*, *46*, 961–971.

Reinhard, M-A., Greifeneder, R., & Scharmach, M. (2013). Unconscious Processes Improve Lie Detection. *Journal of Personality and Social Psychology*, *105*, 721–739.

Reinhard, M. A., & Schwarz, N. (2012). The influence of affective states on the process of lie detection. *Journal of Experimental Psychology: Applied*, *18*, 377–389.

Reinhard, M. A., Sporer, S. L., Scharmach, M., & Marksteiner, T. (2011). Listening, not watching: Situational familiarity and the ability to detect deception. *Journal of Personality and Social Psychology*, *101*, 467.

Rosenblatt, A., Greenberg, J., Solomon, S., Pyszczynski, T, & Lyon, D. (1989). Evidence for terror management theory I: The effects of mortality salience on reactions to those who violate or uphold cultural values. *Journal of Personality and Social Psychology*, *57*, 681–690.

Schimel, J., Simon, L., Greenberg, J., Pyszczynski, T., Solomon, S., Waxmonsky, J., & Arndt, J. (1999). Stereotypes and terror management: Evidence that mortality salience enhances stereotypic thinking and preferences. *Journal of Personality and Social Psychology, 77,* 905–926.

Schindler, S., Reinhard, M.-A., & Stahlberg, D. (2012). Mortality salience increases personal relevance of the norm of reciprocity. *Psychological Reports*, *111*, 565–574.

Schindler, S., Reinhard, M.-A., & Stahlberg, D. (2013). Tit for tat in the face of death: The effect of mortality salience on reciprocal behavior. *Journal of Experimental Social Psychology*, *49*, 87–92.

Schindler, S., Reinhard, M.-A., Stahlberg, D., & Len, A. (in press). Quid pro quo: The effect of individuals' exchange orientation on prosocial behavior and the moderating role of mortality salience. *Social Influence.*

Somanathan, E., & Rubin, P. H. (2004). The evolution of honesty. *Journal of Economic Behavior & Organization*, *54*, 1–17.

Vrij, A. (2000). *Detecting lies and deceit. The psychology of lying and the implications for professional practice.* Chichester: John Wiley.

Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social* Psychology, 53, 1063–1070.

Weber, M., & Ruch, W. (2012). The role of character strengths in adolescent romantic relationships: An initial study on partner selection and mates' life satisfaction. *Journal of Adolescence*, *35*, 1537–1546.

Zuckerman, M., DeFrank, R. S., Hall, J. A., Larrance, D. T., & Rosenthal, R. (1979). Facial and vocal cues of deception and honesty. *Journal of Experimental Social Psychology*, *15*, 378–396.

Footnotes

[1] In Study 1 and 2, data was checked for MS effects on the PANAS and, consistent with prior research on TMT, no significant effects were found, all *p*s > .223.

[2] Note that the same *F*-value occurred when analyzing the three-way interaction on detection accuracy. This is due to the perfect correlation between percentage of messages judged true and the differential score of lie detection and truth detection accuracy, leading to the assumption that detection accuracy does not depend on any detection ability (see also Study 2).

Figure 1. Means of percentage of messages judged true as a function of value priming and salience condition.

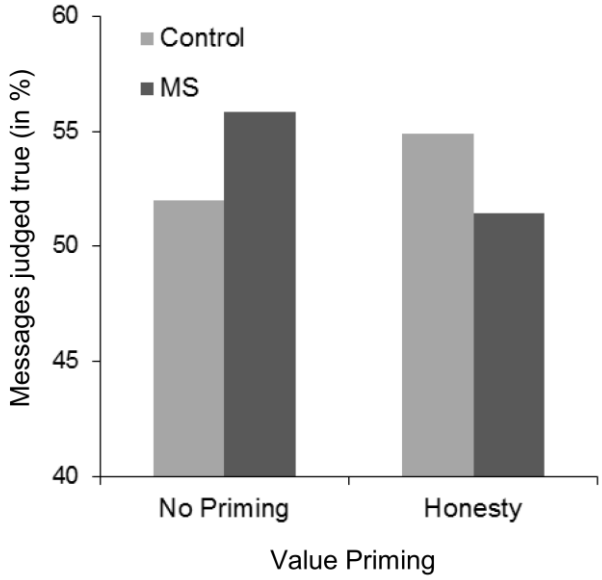
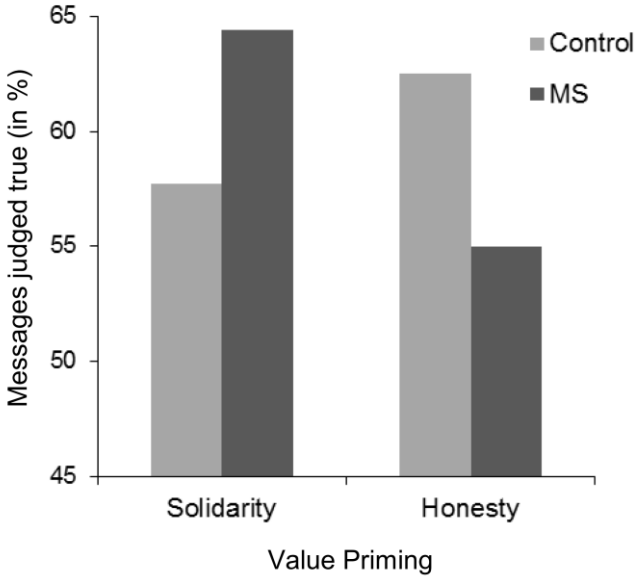


Figure 2. Means of percentage of messages judged true as a function of value priming and salience condition.



APPENDIX F

Schindler, S., Reinhard, M.-A., & Stahlberg, D. (2012). Mortality salience increases personal relevance of the norm of reciprocity. *Psychological Reports*, *111*, 565–574.

MORTALITY SALIENCE INCREASES PERSONAL RELEVANCE OF THE NORM OF RECIPROCITY[1]

SIMON SCHINDLER, MARC-ANDRÉ REINHARD, AND DAGMAR STAHLBERG

University of Mannheim

[1] Address correspondence to Simon Schindler, Department of Social Science, University of Mannheim, A5, 68131 Mannheim, Germany or e-mail (simon.schindler@uni-mannheim.de).

Abstract

Summary.—Research on terror management theory found evidence that people under mortality salience strive to live up to salient cultural norms and values, like egalitarianism, pacifism, or helpfulness. A basic, strongly internalized norm in most human societies is the norm of reciprocity: people should support those who supported them (i.e., positive reciprocity) and people should injure those who injured them (i.e., negative reciprocity), respectively. In an experiment ($N = 98$; 47 females, 51 males), the authors demonstrated that mortality salience overall significantly increased personal relevance of the norm of reciprocity ($M = 4.45$, $SD = 0.65$) compared to a control condition ($M = 4.19$, $SD = 0.59$). Specifically, this was the case for beliefs in reciprocity and for relevance of negative reciprocity, supporting the idea that people under mortality salience are highly motivated to punish those who treated them unfavourably. Unexpectedly, relevance of the norm of positive reciprocity remained unaffected by mortality salience. Implications and limitations are discussed.

.

According to terror management theory (e.g., Greenberg, Pyszczynski, & Solomon, 1986), culture is a means to maintain psychological equanimity and to control the ever-present potential terror of death by making people believe that they are valuable beings in a meaningful reality. From this perspective culture functions as an anxiety buffer consisting of two components: first, the belief in culturally derived norms and values that provide a meaningful, orderly conception of reality. And second, self-esteem, that is the belief to make a substantial contribution to this meaningful reality by living up to those norms and values. Based on that, the mortality salience hypothesis states that reminding people of their mortality should lead them to increase their defense and bolstering of their cultural norms and values, resulting in derogating those who violate important cultural standards and supporting those who uphold them. In their meta-analysis of 277 experiments, Burke, Martens, and Faucher (2010) showed that 80 % thereof significantly supported the mortality salience hypothesis.

Research on terror management theory empirically indicated that on the one hand mortality salience promoted materialism and accumulation of personal wealth (Kasser & Sheldon, 2000). On the other hand mortality salience promoted generosity toward ingroup charities (Jonas, Schimel, Greenberg, & Pyszczynski, 2002). Moreover, mortality salience was found to motivate aggression against people with different beliefs (McGregor et al., 1998). To explain these mixed patterns of behavior, Jonas et al. (2008) connected terror management theory with the focus theory of normative conduct (Cialdini, Kallgren, & Reno, 1991) stating that norms and values only influence behavior to the extent that an individual's attention is focused on them. In other words: like every cognitive construct (e.g., Higgins & Bargh, 1987), norms have to be salient in attention or high in accessibility. This can be the case because people dispositionally follow a norm and/or because certain conditions of the situation itself account for the norm's salience. Based on that reasoning, Jonas et al. (2008)

presented four studies in which they tested and found support for the hypothesis that mortality salience increases people's motivation to live up to social norms and values that are made accessible or salient by the situation. For example, they provided evidence that mortality salience elicited both proself and prosocial attitudes toward helping children, depending on the norm made salient (proself vs. prosocial). Other primed norms in their studies were pacifism, conservatism, or helpfulness. Gailliot, Stillman, Schmeichel, Maner, and Plant (2008) also found support that mortality salience reduced prejudice toward Blacks among non-Black participants if the value of egalitarianism was made salient. Additionally, they found that mortality salience increased self-reported and actual helping behavior, but only when the cultural value of helping was made salient. Fritsche, Jonas, Kayser, and Koranyi (2010) showed that mortality salience enhanced pro-environmental behavior when pro-environmental norms were in focus. Thus, a consistent pattern of results was found in this literature: mortality salience increases people's motivation to follow social norms in order to bolster their culturally derived set of norms and values, depending on which cultural norms and values are salient or activated in a specific situation.

Following social norms can be a means to achieve a goal (e.g., Axelrod, 1984), but social norms can also be strongly internalized so that following them can be seen as a goal in itself (e.g., Cialdini et al., 1991; Kerr, Garst, Lewandowski, & Harris, 1997; Schlenker, 1980). A widespread internalized moral principle for social life—that has been largely neglected by terror management theory so far—is the norm of reciprocity (e.g., Cialdini & Goldstein, 2004). Compared to previously investigated social norms in terror management theory literature (e.g., pacifism, conservatism), the principle of reciprocity has been discussed as being fundamental for the evolutionary development of human altruism and cooperation (Field, 2004). As Gouldner (1960) stated, reciprocity is "one of the universal 'principal components' of moral codes" (p. 161) that exists in all known societies. The norm prescribes

that people should support, and not injure, those who previously supported them (Gouldner, 1960; Uehara, 1995). A great deal of research supports the idea that receiving a favor elicits a feeling of obligation to reciprocate this favor by complying with a following request (e.g., Cialdini, Green, & Rusch, 1992; Edlund, Sagarin, & Johnson, 2007; Regan, 1971; Whatley, Webster, Smith, & Rhodes, 1999). Research has further indicated that reciprocal behavior is shown even in a setting where participants interact anonymously with unknown partners (e.g., Gallucci & Perugini, 2000; Goren & Bornstein, 1999; Rind & Strohmetz, 1999), supporting the idea that people see reciprocal behavior as an important social value, independent of the presence of others or external sanctions. Nevertheless, there is also evidence that reciprocity produces stronger compliance in a public condition compared to a private condition (Whatley et al, 1999).

Besides the positive form of reciprocity (returning a favor), the literature also mentions a negative dimension called the principle of retaliation. It prescribes that people should retaliate against those who have been detrimental to their own interests (e.g., Eisenberger, Lynch, Aselage, & Rohdieck, 2004; Gouldner, 1960; Perugini, Gallucci, Presaghi, & Ercolani, 2003). According to findings of Eisenberger et al. (2004) and Perugini et al. (2003), retributive beliefs form a unitary factor that is distinct from the reciprocation of positive treatment, and are also less valued. They further demonstrated that people who strongly endorse the negative reciprocity norm are also likely to take strong revenge. As a third dimension, Perugini et al. (2003) mentioned beliefs in the efficacy and widespread use of reciprocity-based behaviors and expectations of others' reciprocal behavior that should be conceptually distinguished from the actual performance of reciprocal behavior.

Based on research on terror management theory, indicating that people under mortality salience strive to live up to salient social norms and values, for the present study it was assumed that if following the norm of reciprocity is an important personal value, then

mortality salience should increase the personal relevance of this norm, including all important aspects (i.e., norm of positive / negative reciprocity and beliefs in the efficacy of reciprocity).

METHOD

Participants

Participants in this experiment included 98 students (47 females, 51 males), who were recruited while walking on the campus of a German university (*M* age = 23.69 yr., *SD* = 4.02, range = 18–51). Most participants studied economics (78). Other fields of study were sociology (5) and psychology (1). 14 participants reported "other".

Procedure

The study was labeled as an experiment about "personality and decision making". Having agreed to participate, participants were accompanied to the lab and were randomly assigned to one of the experimental conditions (mortality salience vs. control treatment). After they filled out the demographic measures, they received either the mortality salience or the dentist-visit control treatment, which has been successfully used in several previous studies in order to pronounce the quality of thinking about one's death versus a potentially painful situation (e.g., Jonas et al., 2008).[1] The instruction read as follows: "Please write down the first sentence that comes to your mind when you think about your own death (vs. your latest dental visit)." This mortality salience manipulation was shown to be successful in several studies (e.g., Dechesne et al., 2003; Jonas et al., 2008). When using such explicit death primes, a short delay is necessary to elicit effects of subconsciously defending and bolstering relevant values, because death thoughts first have to exit focal awareness or consciousness (e.g., Arndt, Greenberg, & Cook, 2002). Therefore, as in most studies on terror management theory (see Burke et al., 2010), participants filled out 20 items of the German translation (Krohne, Egloff, Kohlmann, & Tausch, 1996) of the *Positive and Negative Affect Scale* (PANAS; Watson, Clark, & Tellegen, 1988). 10 items ($\alpha = .81$) referred to participants'

current positive affect (attentive, interested, alert, excited, enthusiastic, inspired, proud, determined, strong, and active) and 10 items (α = .82) to participants' current negative affect (distressed, upset, hostile, irritable, scared, afraid, ashamed, guilty, nervous, and jittery). Participants responded to all 20 items on a 5-point Likert scale ranging from 1 (*not at all*) to 5 (*very much*). Afterwards, the personal relevance of the norm of reciprocity was measured as the dependent variable using the *Personal Norm of Reciprocity* questionnaire assessing individual differences in reciprocity as an internalized norm (Perugini et al., 2003).[2] Overall, the questionnaire consisted of 27 personality items containing three subscales: 9 items on *positive reciprocity* (α = .74), focusing on positive reactions to positively valued behaviors (e.g., "If someone does a favor for me, I am ready to return it."), 9 items on *negative reciprocity* (α = .87), focusing on negative reactions to negatively valued behaviors (e.g., "I am willing to invest time and effort to reciprocate an unfair action."), and 9 items on *beliefs in reciprocity* (α = .65), concerning the personal belief that both forms of reciprocity are widely adopted by many people and generally effective in interpersonal and social interactions (e.g., "If I work hard, I expect it will be repaid."). In a series of studies Perugini et al. (2003) successfully validated the *Personal Norm of Reciprocity* scale and found that these constructs of reciprocity played a main role in predicting individual differences in reciprocal behavior, especially when it was a consequence of a personal motivation (Perugini & Gallucci, 2001). Participants responded to all 27 items (α = .77) on a 7-point Likert scale ranging from 1 (*not true for me*) to 7 (*very true for me*). Finally, participants were thanked, and fully debriefed by a research assistant. Participation was paid with two Euros.

Analysis

For testing the hypothesis that mortality salience would increase *Personal Norm of Reciprocity* scores, effects of experimental groups on responses toward all 27 items of the *Personal Norm of Reciprocity* questionnaire were analyzed using analysis of variance

(ANOVA). Additionally, the three subscales were analyzed using three separate ANOVA. Furthermore, an ANOVA with experimental groups as factor and the PANAS as dependent variable was run to make sure that the two conditions have equivalent effects on emotional reactions, leaving the responses toward the reciprocity norm unbiased. For all analyses of the two measures the means of item scores were used.

Results

In a first step, one-way ANOVA on experimental groups showed no effect on PANAS scores (Fs < 1). Thus, consistent with prior research on terror management theory, the manipulation of mortality salience did not create a noticeable confound of emotional reaction. Therefore, a one-way ANOVA with experimental groups as independent and responses to the *Personal Norm of Reciprocity* questionnaire as dependent variable was conducted. Means and standard deviations are reported in Table 1. Consistent with the hypothesis, this yielded a significant effect of experimental groups, $F_{1,96} = 4.50$, $p = .037$, $\eta^2_p = .05$, indicating that participants reported a higher relevance of the norm of reciprocity after mortality salience ($M = 4.45$, $SD = 0.65$) compared to the control group ($M = 4.19$, $SD = 0.59$). Additional analyses of the three subscales revealed a significant effect of experimental groups on *negative reciprocity*, $F_{1,96} = 4.50$, $p = .018$ (one-tailed), $\eta^2_p = .05$, indicating higher scores after mortality salience (Ms = 3.69 vs. 3.17), and a marginally significant effect on *beliefs in reciprocity*, $F_{1,96} = 2.13$, $p = .074$ (one-tailed), $\eta^2_p = .02$, indicating higher scores after mortality salience (Ms = 4.35 vs. 4.09).[3] However, there was no effect on *positive reciprocity* (Ms = 5.31 vs. 5.31), $F < 1$. Including sex as factor yielded no significant main effect of sex on the *Personal Norm of Reciprocity* score, and neither a significant interaction effect of sex and experimental groups, all Fs < 1.

Discussion

Research on terror management theory has indicated that people under mortality salience strive to bolster (or to defend) their cultural worldview. Furthermore, it has been shown that norms can be terror management serving constructs. The present study provided evidence for the hypothesis that mortality salience increases personal relevance of the norm of reciprocity supporting the idea that following the norm of reciprocity can also serve a terror management function. According to the *Personal Norm of Reciprocity* questionnaire (Perugini et al. 2003), there is a conceptual distinction between a positive (reciprocating a favor) and a negative (taking revenge) norm of reciprocity and the beliefs in the efficacy of reciprocity. Interestingly, there were some differences between the three aspects: while beliefs in reciprocity and personal relevance of negative reciprocity increased after mortality salience, there was no effect on relevance of positive reciprocity. Remarkably, participants scored higher on this subscale than on the other subscales, indicating a higher relevance in general, which points to a ceiling effect. Furthermore, as research showed, mortality salience provokes ingroup bias, meaning higher support for ingroup members and degradation of outgroup members to defend one's cultural norms and values (e.g., Castano, Yzerbyt, Paladino, & Sacchi, 2002; Greenberg et al., 1990; Harmon-Jones, Greenberg, Solomon, & Simon, 1996; Jonas, Schimel, Greenberg, & Pyszczynski, 2002; Rosenblatt, Greenberg, Solomon, Pyszczynski, & Lyon, 1989). Therefore, it also seems plausible that under mortality salience the rule of positive reciprocity holds merely for one's ingroup rather than for the outgroup, whereas the rule of negative reciprocity (i.e., "People should injure those who have injured them") holds also for one's ingroup and even stronger for the outgroup. Thus, mortality salience had an effect on personal relevance of negative but not of positive reciprocity, because group membership was not a salient construct in this study. Therefore, future research should address this point by priming group membership.

In the current experiment, the effect-sizes were indeed rather small, yet—in contrast to previous studies (e.g., Jonas et al., 2008)—the mortality salience effect was shown to occur without explicitly priming the norm of reciprocity, suggesting the assumption that the effect will be enhanced after priming. Although Jonas et al. (2008) used more indirect measures of norm-relevant behavior, rather than explicit endorsement of the norm per se, one might also speculate that the norm becomes spontaneously accessible following mortality salience. However, it seems plausible that the norm can be easily activated by the situation. First, merely presenting participants with the reciprocity items may have primed the norm. And second, participants were recruited on a university campus and were given two Euros in exchange for their participation in the study. This situation is a reciprocal relationship in which the participant expects the experimenter to reciprocate in response to their agreement to participate. In order to test whether a prime is necessary to obtain the effect, an experimental situation is needed that does not itself prime the norm. Additionally, it should be explicitly manipulated whether or not the norm is primed. If priming is not necessary, then one would only expect a main effect of mortality salience, and not an interaction of mortality salience and priming.

It is important to note that regarding the recruitment procedure there was no random sampling. But although the current findings are based on a student sample, it is assumed that the results can be generalized to a broader population given that the norm of reciprocity is a widespread internalized moral principle for social life (e.g., Cialdini & Goldstein, 2004). Despite this assumption, there is also research indicating that a favor led to higher compliance only under specific conditions—for example under self-regulatory resource depletion (Fennis, Janssen, & Vohs, 2009)—depicting the limitations of the norm of reciprocity.

Given that the results are restricted to attitudes toward the norm, future research should address intentions or actual behavior in more specific contexts. Considering the results, it could be assumed that people under mortality salience are more willing to punish a person for unfavorable treatment. Additionally, it was shown that the acceptance of such negative reciprocity was much lower than is returning a favor. Therefore, it is reasonable that more severe punishment under mortality salience depends on how strong people believe in the value of retaliation. Those who do not believe in this value—but rather believe in the value of forgiveness—might punish less severely in this case. Given that relevance of positive reciprocity was not enhanced by mortality salience, future research should use more indirect measures of norm-relevant behavior. It seems plausible, for instance, that people under mortality salience are more willing to return a favor. In sum, the present study provided further evidence that norms are important cognitive constructs for coping with the inevitability of one's own death and extended previous findings by supporting the idea that the norm of reciprocity also serves a terror management function.

References

Arndt, J., Greenberg, J., & Cook, A. (2002) Mortality salience and the spreading activation of worldview-relevant constructs: Exploring the cognitive architecture of terror management. *Journal of Experimental Psychology: General*, 131, 307–324. doi:10.1037//0096-3445.131.3.307

Axelrod, R. (1984) *The Evolution of Cooperation*. New York: Basic Books.

Burke, B. L., Martens, A., & Faucher, E. H. (2010) Two decades of terror management theory: A meta-analysis of mortality salience research. *Personality and Social Psychology Review*, 14, 155–195. doi:10.1177/1088868309352321

Castano, E., Yzerbyt, V., Paladino, M.-P., & Sacchi, S. (2002) I belong, therefore, I exist: Ingroup identification, ingroup entitativity, and ingroup bias. *Personality and Social Psychology Bulletin,* 28, 135–143. doi:10.1177/0146167202282001

Cialdini, R. B., & Goldstein, N. J. (2004) Social influence: Compliance and conformity. *Annual Review of Psychology*, 55, 591–621. doi:10.1146/annurev.psych.55.090902.142015

Cialdini, R. B., Green, B. L., & Rusch, A. J. (1992) When Tactical Pronouncements of Change Become Real Change: The Case of Reciprocal Persuasion. *Persuasion Journal of Personality and Social Psychology*, 63(1), 30–40. doi:10.1037/0022-3514.63.1.30

Cialdini, R. B., Kallgren, C. A., & Reno, R. R. (1991) A focus theory of normative conduct: A theoretical refinement and reevaluation of the role of norms in human behavior. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 24, pp. 201–234). San Diego, CA: Academic Press. doi:10.1016/S0065-2601(08)60330-5

Dechesne, M., Pyszczynski, T., Arndt, J., Ransom, S., Sheldon, K. M., van Knippenberg, A., & Janssen, J. (2003) Literal and symbolic immortality: The effect of evidence of

literal immortality on self-esteem striving in response to mortality salience. *Journal of Personality and Social Psychology,* 84, 722–737.

Edlund, J. E., Sagarin, B. J., & Johnson, B. S. (2007) Reciprocity and the belief in a just world. *Personality and Individual Differences,* 43, 589–596. doi:10.1016/j.paid.2007.01.007

Eisenberger, R., Lynch, P., Aselage, J., & Rohdieck, S. (2004) Who takes the most revenge? Individual differences in negative reciprocity norm endorsement. *Personality and Social Psychology Bulletin,* 30, 787–799. doi:10.1177/0146167204264047

Fennis, B. M., Janssen, L., & Vohs, K. D. (2009) Acts of benevolence: A limited–resource account of compliance with charitable requests. *Journal of Consumer Research,* 35, 906–924. doi:10.1086/593291

Field, A. J. (2004) *Altruistically inclined? The behavioural sciences, evolutionary theory, and the origins of reciprocity.* Ann Arbor: University of Michigan Press.

Fritsche, I., Jonas, E., Kayser, D. N., & Koranyi, N. (2010) Existential threat and compliance with pro-environmental norms. *Journal of Environmental Psychology,* 30, 67–79. doi:10.1016/j.jenvp.2009.08.007

Gailliot, M. T., Stillman, T. F., Schmeichel, B. J., Maner, J. K., & Plant, E. A. (2008) Mortality salience increases adherence to salient norms and values. *Personality and Social Psychology Bulletin*, 34, 993–1003. doi:10.1177/0146167208316791

Gallucci, M., & Perugini, M. (2000) An experimental test of a game-theoretical model of reciprocity. *Journal of Behavioral Decision Making,* 13, 367–389. doi:10.1002/1099-0771(200010/12)13:4<367::AID-BDM357>3.0.CO;2-9

Goren, H., & Bornstein, G. (1999) Reciprocation and learning in the Intergroup Prisoner's Dilemma Game. In D. V. Budescu, I. Erev, & R. Zwick (Eds.), *Games and human behavior: Essays in honor of Amnon Rapoport* (pp. 299–314). Mahwah, NJ: Erlbaum.

Gouldner, A. (1960) The norm of reciprocity: A preliminary statement, *Journal of Social and Personal Relationships*, 2, 351–375. doi:10.2307/2092623

Greenberg, J., Pyszczynski, T., & Solomon, S. (1986) The cause 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., Rosenblatt, A., Veeder, M., Kirkland, S., & Lyon, D. (1990) Evidence for terror management theory: II. The effects of mortality salience reactions to those who threaten or bolster the cultural worldview. *Journal of Personality and Social Psychology,* 58, 308–318.

Hair, J. F., Jr., Anderson, R. E., Tatham, R. L., & Black, W. C. (1995). *Multivariate data analysis with readings* (4th ed.). Upper Saddle River, NJ: Prentice Hall.

Harmon-Jones, E., Greenberg, J., Solomon, S., & Simon, L. (1996) The effects of mortality salience on intergroup bias between minimal groups. *European Journal of Social Psychology,* 26, 677–681.

Higgins, E.T., & Bargh, J. E. (1987) Social cognition and social perception. *Annual Review of Psychology,* 38, 369–425. doi:10.1146/annurev.psych.38.1.369

Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indices in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*, *6*, 1–55. doi:10.1080/10705519909540118.

Jonas, E., Martens, A., Niesta, D., Fritsche, I., Sullivan, D., & Greenberg, J. (2008) Focus theory of normative conduct and terror management theory: The interactive impact of mortality salience and norm salience on social judgment. *Journal of Personality and Social Psychology*, 95, 1239–1251. doi:10.1037/a0013593

Jonas, E., Schimel, J., Greenberg, J., & Pyszczynski, T. (2002) The Scrooge effect: Evidence that mortality salience increases prosocial attitudes and behavior. *Personality and Social Psychology Bulletin,* 28, 1342–1353. doi:10.1177/014616702236834

Kasser, T., & Sheldon, K. M. (2000) Of wealth and death: Materialism, mortality salience, and consumption behavior. *Psychological Science,* 11, 348–351. doi:10.1111/1467-9280.00269

Keller, J., Hurst, M., & Uskul, A. (2008). Prevention-focused self-regulation and aggressiveness. *Journal of Research in Personality*, *42*, 800–820.

Kerr, N. L., Garst, J., Lewandowski, D. A., & Harris, S. E. (1997) That still, small voice: commitment to cooperate as an internalized versus a social norm. *Personality and Social Psychology Bulletin,* 23, 1300–1311. doi:10.1177/01461672972312007

McGregor, H. A., Lieberman, J. D., Greenberg, J., Solomon, S., Arndt, J., Simon, L., & Pyszczynski, T. (1998) Terror management and aggression: Evidence that mortality salience motivates aggression against worldview-threatening others. *Journal of Personality and Social Psychology,* 74(3), 590–605. doi:10.1037//0022-3514.74.3.590

Perugini, M., & Gallucci, M. (2001) Individual differences and social norms: The distinction between reciprocators and prosocials. *European Journal of Personality,* 15, 19–35. doi:10.1002/per.419

Perugini, M., Gallucci, M., Presaghi, F., & Ercolani, A. P. (2003) The personal norm of reciprocity. *European Journal of Personality*, 17, 251–283. doi:10.1002/per.474

Regan, D. (1971) Effects of a favor and liking on compliance. *Journal of Experimental Social Psychology*, 7, 627–639. doi:10.1016/0022-1031(71)90025-4

Rind, B., & Strohmetz, D. (1999) Effect on restaurant tipping of a helpful message written on the back of customer's checks. *Journal of Applied Social Psychology,* 29, 139–144. doi:10.1111/j.1559-1816.1999.tb01378.x

Rosenblatt, A., Greenberg, J., Solomon, S., Pyszczynski, T, & Lyon, D. (1989) Evidence for terror management theory I: The effects of mortality salience on reactions to those who violate or uphold cultural values. *Journal of Personality and Social Psychology,* 57, 681–690. doi:10.1037/0022-3514.57.4.681

Schlenker, B. R. (1980). *Impression management*. Monterey, CA: Brooks Cole.

Uehara, E. S. (1995) Reciprocity reconsidered: Gouldner's 'moral norm of reciprocity' and social support. *Journal of Social and Personal Relationships*, 12(4), 483–502. doi:10.1177/0265407595124001

Watson, D., Clark, L. A., & Tellegen, A. (1988) Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology*, 53, 1063–1070. doi:10.1037//0022-3514.54.6.1063

Whatley, M. A., Webster, J. M., Smith, R. H., & Rhodes, A. (1999) The effect of a favor on public and private compliance: how internalized is the norm of reciprocity. *Basic and Applied Social Psychology*, 21, 251–259. doi:10.1207/S15324834BASP2103_8

FOOTNOTES

[1] In a meta-analysis, Burke et al. (2010) found no evidence that mortality salience effects depended on whether the control condition contained a neutral/positive topic or a threatening/negative topic.

[2] A translated German version, which was successfully used in previous research by Keller, Hurst, and Uskul (2008), was applied. In order to compare the factors of this version to those of the original one a confirmatory factor analysis (CFA) was conducted. The analysis was based on covariance matrices and used maximum-likelihood estimation. In addition to reporting the chi-square test statistic, we report the Root mean square error of approximation (RMSEA), the Tucker-Lewis index (TLI), the comparative fit index (CFI) and the Standardized root mean square residual (SRMR). The following criteria were used to evaluate the model fit: $\chi^2/df < 2$ (Hair, Anderson, Tatham, & Black, 1995), RMSEA $\leq .08$, CFI $\geq .95$ (Hu & Bentler, 1999). The χ^2 value for the model was 537.38 with 321 degrees of freedom. Testing the model revealed a mixed picture: whereas χ^2/df and RMSEA indicated an acceptable model fit ($\chi^2/df = 1.67$; RMSEA = .08), CFI did not indicate a good model fit (CFI = .75). Comparing reliabilities of the used translated scale with the original scale of Perugini et al. (2003) revealed no difference [*positive reciprocity*: $\alpha = .74$ vs. .76 (original value); *negative reciprocity*: $\alpha = .87$ vs. .83 (original value); *beliefs in reciprocity*: $\alpha = .65$ vs. .67 (original value)]. Furthermore, testing differences in the control group between the three subscales of the *Personal Norm of Reciprocity* questionnaire revealed that participants scored statistically significantly higher on *positive reciprocity* ($M = 5.31$, $SD = .95$) compared to *beliefs in reciprocity* ($M = 4.09$, $SD = .91$), $F_{1,46} = 60.90$, $p < .001$, $\eta^2_p = .57$, and also compared to *negative reciprocity* ($M = 3.17$, $SD = .96$), $F_{1,46} = 103.45$, $p < .001$, $\eta^2_p = .69$.

Participants scored statistically significantly higher on *beliefs in reciprocity* compared to *negative reciprocity*, $F_{1,46} = 21.13$, $p < .001$, $\eta^2_p = .32$. This pattern of means corresponded to the original version of Perugini et al. (2003). Finally, the German scale was retranslated by an expert. Comparing this version with the original version of Perugini et al. (2003) revealed that they were equivalent.

[3] Note that given the directional hypothesis, these effects were tested as one-tailed.

Table 1

Means of "Personal Norm of Reciprocity" as Function of Experimental Groups

Personal Norm of Reciprocity	Mortality Salience	Control Group
Overall (α = .77)	4.45 (0.65)	4.19 (0.59)
Positive Reciprocity (α = .74)	5.31 (0.68)	5.31 (0.95)
Negative Reciprocity (α = .87)	3.69 (1.41)	3.17 (0.96)
Beliefs in Reciprocity (α = .65)	4.35 (0.87)	4.09 (0.91)

Note. Standard deviations in parentheses. Personal Norm of Reciprocity was measured on seven-point scales, with higher means expressing higher relevance.

APPENDIX G

Schindler, S., Reinhard, M.-A., & Stahlberg, D. (2013). Tit for tat in the face of death: The effect of mortality salience on reciprocal behavior. *Journal of Experimental Social Psychology*, *49*, 87–92.

This is the author's final article version, published by Elsevier in the Journal of Experimental Social Psychology, available online:
http://www.sciencedirect.com/science/article/pii/S0022103112001345

Journal of Experimental Social Psychology 49 (2013) 87–92

Contents lists available at SciVerse ScienceDirect

Journal of Experimental Social Psychology

journal homepage: www.elsevier.com/locate/jesp

Reports

Tit for tat in the face of death: The effect of mortality salience on reciprocal behavior

Simon Schindler *, Marc-André Reinhard, Dagmar Stahlberg

Department of Social Science, University of Mannheim, Germany

HIGHLIGHTS

- People under mortality salience strive to live up to cultural norms.
- It is indicated that mortality salience increases following the norm of reciprocity.
- In Study 1, a favor of a server led to higher tip after making mortality salient.
- In Study 2, valuing retaliation led to harsher punishment under mortality salience.
- Results show that the norm of reciprocity is an important element of people's worldview.

ARTICLE INFO

Article history:
Received 16 October 2011
Revised 10 June 2012
Available online 16 July 2012

Keywords:
Terror management theory
Mortality salience
Norms
Reciprocal behavior
Personal norm of reciprocity

ABSTRACT

Research on terror management theory has found evidence that people under mortality salience strive to live up to salient cultural norms and values, such as egalitarianism, pacifism, or helpfulness. A basic and strong internalized norm in most human societies is the norm of reciprocity: People should support those who have supported them, and people should injure those who have injured them, respectively. In two experiments, the authors demonstrate that mortality salience increases adherence to the norm of reciprocity. In Study 1, a favor of a server led to higher tipping after making mortality salient. Study 2 indicated that mortality salience motivated participants to act according to their high dispositional relevance of the norm of negative reciprocity following an unfavorable treatment: Those participants gave less money to a person who had previously refused to help them.

Introduction

Research on terror management theory (TMT; Greenberg, Pyszczynski, & Solomon, 1986) has found evidence that people under mortality salience (MS) strive to live up to salient cultural norms and values, such as egalitarianism, pacifism, or helpfulness (Gailliot, Stillman, Schmeichel, Maner, & Plant, 2008; Jonas et al., 2008). Assuming that the norm of reciprocity is strongly internalized in most human societies, in the current paper we investigate the idea that MS increases the motivation to follow the norm of reciprocity.

Research on TMT and adherence to salient social norms

A large number of studies concerning the effect of people's reaction to thinking about their own death have indicated that the human animal is a cultural animal. According to TMT (e.g., Greenberg et al., 1986), culture functions as an anxiety buffer against the ever-present potential terror of death by providing a meaningful, orderly conception of reality that contains a set of standards and values. By living up to those standards, people believe that they are valuable beings in a meaningful reality. Based on this idea, the MS hypothesis states that reminding people of their mortality should lead them to increase their defenses and bolster their cultural worldview, resulting in derogating those who violate important cultural standards and supporting those who uphold them. In their meta-analysis, Burke, Martens, and Faucher (2010) showed that 80% of a total 277 experiments significantly supported the MS hypothesis.

Research has further indicated that living up to social standards under MS means promotion of materialism and accumulation of personal wealth (Kasser & Sheldon, 2000) but sometimes also promotion of generosity toward ingroup charities (Jonas, Schimel, Greenberg, & Pyszczynski, 2002). Moreover, MS was found to motivate aggression against worldview-threatening others (McGregor et al., 1998). To explain these mixed patterns of behavior, Jonas et al. (2008) connected TMT with the focus theory of normative conduct (Cialdini, Kallgren, & Reno, 1991), stating that norms only influence behavior to the extent that an individual's attention is focused on the norms. That is, like every cognitive construct (e.g., Higgins & Bargh, 1987), norms have to be salient in attention or high in accessibility. This may be because people dispositionally follow a norm and/or because certain conditions of the situation itself account for the norm's salience. Based on that reasoning, Jonas et al. (2008) presented four studies in which they tested and found support for the hypothesis that after MS, people will strive to live up to the social norms that are made salient or

* Corresponding author at: Department of Social Science, University of Mannheim, A5, 68131 Mannheim, Germany. Fax: +49 621 181 2038.
E-mail address: simon.schindler@uni-mannheim.de (S. Schindler).

0022-1031/$ – see front matter © 2012 Elsevier Inc. All rights reserved.
doi:10.1016/j.jesp.2012.06.002

activated by the situation. For example, they provided evidence that MS elicited both proself and prosocial attitudes toward helping children, depending on the norm that was made salient (proself vs. prosocial). Results of four studies by Gailliot et al. (2008) also supported this idea. They indicated, for example, that MS increased self-reported and actual helping behavior, but only when the cultural value of helping was salient. Thus, a consistent pattern of results were found in this literature: According to research on TMT, MS increases people's motivation to follow social norms in order to bolster their cultural worldview, depending on which cultural standards and norms are salient or activated in a specific situation.

Reciprocity: A basic value for social life

Following social norms can be a means to achieve a goal (e.g., Axelrod, 1984), but social norms can also be strongly internalized so that following them can be seen as a goal in itself (e.g., Cialdini et al., 1991; Kerr, Garst, Lewandowski, & Harris, 1997; Schlenker, 1980). A widespread internalized moral principle for social life – that has been largely neglected by TMT so far – is the norm of reciprocity (e.g., Cialdini & Goldstein, 2004). Compared to previously investigated social norms in TMT literature (e.g., pacifism, conservatism), the principle of reciprocity has been discussed as being fundamental for the evolutionary development of human altruism and cooperation (Field, 2004). As Gouldner (1960) stated, reciprocity is "one of the universal 'principal components' of moral codes" (p. 161) that exists in all known societies. The norm prescribes that people should support, and not injure, those who previously supported them (Gouldner, 1960; Uehara, 1995). A great deal of research supports the idea that a favor leads to higher compliance toward a following request of the favor-doer (e.g., Cialdini, Green, & Rusch, 1992; Edlund, Sagarin, & Johnson, 2007; Regan, 1971; Whatley, Webster, Smith, & Rhodes, 1999). Research has further indicated that reciprocal behavior is shown even in a setting where participants behave anonymously with unknown partners (e.g., Gallucci & Perugini, 2000; Goren & Bornstein, 1999; Rind & Strohmetz, 1999), supporting the idea that people see reciprocal behavior as an important social value, independent of the presence of others or external sanctions. Nevertheless, there is also evidence that reciprocity produces stronger compliance in a public condition compared to a private condition (Whatley et al., 1999). Additionally, stronger compliance occurs under self-regulatory resource depletion (Fennis, Janssen, & Vohs, 2009) or when people have a strong belief in a just world (Edlund et al., 2007).

Besides the positive form of reciprocity (returning a favor), literature also mentions a negative dimension called the principle of retaliation, purporting that people should retaliate upon those who have been detrimental to their own interests (e.g., Eisenberger, Lynch, Aselage, & Rohdieck, 2004; Gouldner, 1960; Perugini, Gallucci, Presaghi, & Ercolani, 2003). According to findings of Eisenberger et al. (2004) and Perugini et al. (2003), retributive beliefs form a unitary factor that is distinct from beliefs concerning the reciprocation of positive treatment, and are also less valued. They further demonstrated that people who strongly endorse the negative reciprocity norm are also likely to take strong revenge and, additionally, that such retributive beliefs varied in strength among individuals. This seems plausible considering that this "eye for an eye" principle contradicts widespread humanistic values, such as the inviolability of human dignity, pacifism, tolerance, or compassion (e.g., Fromm, 2005). Nevertheless, if taking revenge and reciprocating a favor are important values in people's worldview, then they should also serve a terror management function. We assume that the extent to which the norm of reciprocity becomes relevant to people differs between situations (i.e., some situations call for reciprocity, others don't) and also between the dispositional relevance between individuals (i.e., for some individuals reciprocity is highly relevant, for others not).

The present research

Based on findings of TMT research, people under MS strive to live up to social norms that are made salient or activated by the situation. Assuming that the positive norm of reciprocity is a universal, strongly internalized moral norm – and therefore an important value in people's worldview – we hypothesized that MS increases the motivation to comply with this norm in a situation that calls for reciprocating a favor (Study 1). Supposing that striving to live up to dispositional values can also serve a terror management function, we hypothesized that in cases of unfavorable treatment, MS should increase participants' motivation to retaliate when they strongly believe in the value of retaliation. This should further affect their response toward the favor-denier: Under MS, participants who strongly believe in the value of retaliation should punish more severely than should participants in the control condition (Study 2).

Study 1

In this study, we focused on participants' behavioral intentions of returning a favor under MS. Research has indicated that a favor of a server increases tip percentages (Rind & Strohmetz, 1999). Thus, in a fictitious scenario, participants read that they had received a favor from a server. Afterwards, they were asked about the amount of tip they would give. According to our idea that MS increases the motivation of reciprocating a favor because of its high value in people's worldview, people should give a higher tip under MS after having received a favor. In this case, the norm of reciprocity is activated and participants strongly strive to live up to the norm; that is, they clearly want to return the received favor by giving an exceptionally high tip.

Method

Subjects and design

Participants in this study included 69 students (36 women and 33 men) recruited on the campus of a German university ($M_{age} = 22.93$, $SD = 1.48$). They were randomly assigned to the experimental conditions in a 2 (MS: mortality vs. dentist condition) × 2 (norm activation: favor vs. no-favor condition) between-subjects factorial design. Participation was paid and voluntary.

Procedure and measures

Participants came into the lab and were assigned to a computer by the experimenter. The cover story was as follows: Participants read that the experiment was about personality and decision making. After participants filled out the demographic measures, they received the MS or the dentist-visit control treatment, which has successfully been used in previous studies (e.g., Dechesne et al., 2003; Jonas et al., 2008): Individual participants were asked to write down the first sentence that came to their mind when they thought about their own death (mortality condition) or about their latest dentist-visit (control condition). When using such explicit death primes, a distractor is necessary to elicit effects of distal defense (Arndt, Greenberg, & Cook, 2002; Greenberg, Pyszczynski, Solomon, Simon, & Breus, 1994). Therefore, as in most studies on TMT, participants filled out 20 items of the Positive and Negative Affect Scale (PANAS; Watson, Clark, & Tellegen, 1988). Then, they were instructed that in the following part they would receive a description of a scenario and that it would be important to read it carefully in order to have a clear, realistic picture of it. They were further told to imagine as vividly and precisely as possible how they would feel in such a situation. The scenario in the favor condition read as follows:

> Imagine you go out for food at a restaurant. There you are served by the owner of the restaurant. You perceive the owner as polite

and courteous. Also, the food tastes good to you. After dessert, the owner surprisingly brings you an espresso on the house. You drink it up and then you want to pay. The owner brings a bill in the amount of 20.10 Euros.

Participants in the no-favor condition read the following scenario: Imagine you go out for food at a restaurant. There you are served by the owner of the restaurant. You perceive the owner as polite and courteous. Also, the food tastes good to you. After dessert, you want to pay. The owner brings a bill in the amount of 20.10 Euros.

Then participants were asked how much money (including tip) they would give to the owner. Afterwards, participants were thanked, paid, and fully debriefed by a research assistant.

Results and discussion

We first checked whether gender influenced the amount of tipping and found no significant effect ($F<1$). Also, data was controlled for any effects on the PANAS and, consistent with prior research on TMT, no effects were found (Fs<1). Therefore, we ran an ANOVA with MS and norm activation as independent variables and the amount of tip as the dependent variable. We calculated the tip by subtracting 20.10 from the amount of money participants reported they would give. There were no significant main effects of MS, $F(1, 65)=2.484$, $p=.120$, $\eta^2_p=.04$, or norm activation, $F(1, 65)=1.92$, $p=.170$, $\eta^2_p=.03$. Yet, as predicted, the analysis yielded a significant interaction effect between MS and norm activation, $F(1, 65)=4.04$, $p=.049$, $\eta^2_p=.06$. The follow-up simple effects analyses within norm activation showed that participants in the favor condition gave significantly higher tips in the mortality condition ($M=2.38$, $SD=0.89$) than in the dentist condition ($M=1.54$, $SD=0.93$), $F(1, 65)=6.38$, $p=.014$, $d=.93$ (see Fig. 1). In the no-favor condition, participants gave equal tips, independent of MS manipulation ($M_{CG}=1.69$, $SD=0.85$ and $M_{MS}=1.59$, $SD=1.19$), $F<1$. Moreover, simple effects analyses within MS revealed that participants in the favor condition gave significantly higher tips in the mortality condition than participants in the no-favor condition, $F(1, 65)=5.86$, $p=.018$, $d=.48$. In the dentist condition, there were no significant differences between participants in the favor and no-favor condition ($F<1$). Thus, compared to all other conditions, it has been shown that participants gave significantly higher tips when they received a favor after thinking about death.

In this study we found evidence for our hypothesis that the tendency to follow the positive norm of reciprocity is increased after MS. After having received a favor (i.e., espresso on the house), participants gave a higher tip to the server under MS. Notably, there was no main effect of MS manipulation, indicating that participants did not give a higher tip just because of MS, but only when the norm of reciprocity was activated. Neither there was a main effect of norm activation. That is, reciprocity activation failed to produce an increase in the dentist condition, contrary to what the focus theory of normative conduct would have suggested (Cialdini et al., 1991). However, in line with this finding, not all norm-focus studies have found effects of simply activating the norm, but have found an effect only when moderators (e.g., MS) came into play (Fennis et al., 2009, Study 2; Fritsche, Jonas, Kayser, & Koranyi, 2010; Jonas et al., 2008, Studies 1 and 2; Kallgren, Reno, & Cialdini, 2000, Study 1). For example, Jonas et al. (2008) (see also Fritsche et al., 2010) argued that their norm primes were particularly subtle and required little focus of conscious attention, whereas norm-focus studies generally used rather explicit orders (e.g., "Do not litter!"; Cialdini et al., 1991). We speculate that the lacking main effect of favor in our study could relate to the fact that the activation of the reciprocity norm is supposed to induce only a weak feeling of obligation to reciprocate a favor (i.e., reading a scenario) compared to an actual favor (Regan, 1971). Therefore, assuming that motivation to act according to activated norms is enhanced by MS, in the absence of this motivation, we speculate that simple norm activation does not always have this effect; yet with the death prime, motivation to bolster the worldview's social norms produces norm conformity.

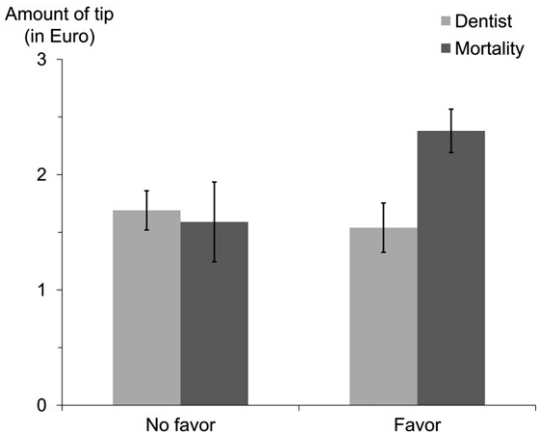


Fig. 1. Means of tip by norm activation and MS.

Study 2

Study 1 provided evidence that MS increases the motivation to reciprocate a favor. In Study 2, we tested the effect of MS on taking revenge for an unfavorable treatment. Early studies on TMT suggested that MS led to harsher punishment for moral transgressions only when participants believed that the target's behavior was truly immoral (e.g., Rosenblatt, Greenberg, Solomon, Pyszczynski, & Lyon, 1989). Assuming that the moral value of retaliation is not accepted by all people and varies dispositionally, we hypothesized that in cases of unfavorable treatment, participants under MS should increase motivation to retaliate only when they strongly believe in the value of retaliation. To test this hypothesis, participants read a scenario in which they had to play a dictator game with a person who previously had refused to help them (see Perugini et al., 2003). We predicted that when participants strongly believe in the negative norm of reciprocity, MS should lead to harsher punishment toward the favor-denier (i.e., they would give a lower amount of money) compared to the control group. Additionally, we assessed participants' relevance of the positive norm of reciprocity and belief in its efficacy for checking our assumption that negative reciprocity is valued less and more dispositionally varying. However, the relevance of those dimensions is not expected to play a crucial role in participants' decision, as they are not directly linked to the situation of retaliation.

Method

Subjects and design

Participants in this study included 58 students (27 women and 31 men) recruited on the campus of a German university ($M_{age}=22.52$, $SD=3.68$). They were randomly assigned to the experimental between-subjects conditions (salience: MS vs. dentist visit). Participation was paid and voluntary.

Procedure and measures

The procedure was similar to that used in Study 1. After participants received either the MS or the dentist-visit control treatment, they filled out the PANAS. Then they were instructed that in the following part they would receive a description of a scenario and that

it would be important to read it carefully in order to have a clear and realistic picture of it. The scenario read as follows:

> Imagine you have a bad headache and therefore you miss an important lecture just before an upcoming exam. The next day, you meet a fellow student (Person A). You want to know if the lecturer said anything important about the exam. Person A refuses to help you by deceiving you, pretending also to have been absent yesterday. Later, another person informs you that this cannot be true because this person saw Person A during the lecture.

The scenario continued with a description of a dictator game to give participants the chance to take revenge on Person A:

> Later on the same day, you participate in a study at the university. In this study you are randomly assigned to another participant. To your surprise, you are assigned to Person A from earlier this morning. The topic of the study is about a distribution decision you have to make: Ten Euros are provided to you. Now you can freely choose how much of the 10 Euros you will give to Person A and how much you will keep for yourself. Your decision constitutes the payment for participating. That is to say, the amount you keep for yourself is also the amount of money you actually get for your participation in this study. The amount you give away is Person A's payment.

Then, participants were asked how much of the 10 Euros they wanted to give to Person A. Afterwards, the personal norm of reciprocity questionnaire (PNR; Perugini et al., 2003) was used to measure the relevance of negative reciprocity (e.g., "I am willing to invest time and effort to reciprocate an unfair action"; 9 items, $\alpha = .85$). We also measured the relevance of positive reciprocity ("If someone does a favor for me, I am ready to return it", 9 items, $\alpha = .82$) and belief in reciprocity (e.g., "If I work hard, I expect it will be repaid", 9 items, $\alpha = .71$). In order to avoid priming effects, all 27 items were assessed after the manipulation and the following main dependent variable. Participants responded to all items on a 7-point Likert-type scale ranging from 1 (not true for me) to 7 (very true for me). After having completed all items, participants were thanked, paid, and fully debriefed by a research assistant.

Results and discussion

We first checked whether there were any significant effects for gender on the subscales of the PNR or the amount of money given, and found none ($ps > .283$). There were also no significant effects of MS on the subscales of the PNR ($ps > .182$). Comparing the mean scores of the negative reciprocity dimension ($M = 3.37$; $SD = 1.12$) and the positive reciprocity dimension ($M = 5.56$; $SD = .83$) supported our assumption that the negative norm is valued less than the positive norm, $t(56) = -11{,}99$, $p < .001$. Additionally, comparing the standard deviations is consistent with our idea that the dispositional relevance of the norm of negative reciprocity is more varying. A *t*-test designed for two population variances of paired observations (Pitman-Morgan Test; see Morgan, 1939) revealed that the variances were significantly different, $t(56) = 2.26$, $p = .028$.[1] Furthermore, there were no significant MS effects on the PANAS (positive affect: $F < 1$, negative affect: $F(1, 56) = 3.59$, $p = .062$).[2] To test our hypothesis, we used a multiple linear regression analysis with MS, relevance of the norm of negative reciprocity, and the two-way interaction term (MS × negative reciprocity) to predict the amount of money given to the favor-denier. The relevance of the norm of negative reciprocity as a predictor was standardized and MS was centered (coded −1 for the dentist condition and 1 for the mortality condition) to reduce collinearity between the continuous moderator and the interaction term (cf. Aiken & West, 1991). MS was postulated to determine the amount of money, depending on the personal relevance of the norm of negative reciprocity.

The entire model explained 17.1% (12.5% adjusted) of the variability in money given to the favor-denier, $F(3, 52) = 3.72$, $p = .017$. There was no significant effect of MS, $b = -.14$, $SE\ b = .25$, $t(54) = -.55$, $p = .583$, but a significant effect for relevance of negative reciprocity, $b = -.78$, $SE\ b = .26$, $t(54) = -3.01$, $p = .004$. As expected, there was a significant effect of the interaction term, $b = -.56$, $SE\ b = .26$, $t(54) = -2.16$, $p = .035$, $\Delta R^2 = 0.07$. To investigate the nature of this interaction, the conditional regression procedure suggested by Aiken and West (1991) was used. We probed the interaction by testing the effect of MS on money for high (1 SD above the mean) and low (1 SD below the mean) relevance of the norm of negative reciprocity. In line with our predictions, results revealed that for participants who reported a high relevance of the norm of negative reciprocity (1 SD above the mean), MS had a marginally significant effect on the amount of money given, $b = -.70$, $SE\ b = .37$, $t(54) = -1.88$, $p = .065$.[3] In other words, participants under MS who reported high relevance of the norm of negative reciprocity gave an average of 1.40 Euros less to the favor-denier than participants in the dentist condition (see Fig. 2). Participants who reported a low relevance of the norm (1 SD below the mean) remained insignificantly influenced by MS, $b = .42$, $SE\ b = .35$, $t(54) = 1.22$, $p = .228$.

We also tested both the effects of belief in reciprocity and the relevance of positive reciprocity on the amount of money given, and found that none of these predictors had a significant effect ($ps > .183$). Neither there were significant interaction effects with MS ($ps > .147$).

The results support the hypothesis that under MS, participants who reported a high relevance of the norm of negative reciprocity gave less money than participants in the dentist condition. Participants who reported a low relevance remained unaffected by MS. Moreover, there was no main effect of MS on the amount of money given, indicating that people do not punish more severely just because of the salience of their own death, but according to their dispositional attitude toward retaliation.

General discussion

People under MS strive to bolster or to defend their cultural worldview. Research on TMT has indicated that norms can be terror management-serving constructs, but only if they are salient or accessible. In two experiments, we tested and found evidence for the hypothesis that following the norm of reciprocity can also serve a terror management function. We conceptually distinguished between a positive norm (reciprocating a favor) and a negative norm of reciprocity (taking revenge). In Study 1, we found evidence that a favor of a server led to higher tipping under MS. Thus, when the norm of reciprocity was activated through the favor, participants were highly motivated to reciprocate it explicitly by giving a higher tip. In line with previous research, we did not find a main effect of MS, supporting the idea that reminders of death did not lead to higher tipping per se, but did lead to higher tipping only when the norm of

[1] We also used an *F*-test suggested by Kanji (1999, p. 38) to test the differences of two population variances from paired observations. This test also supported our hypothesis that the two variances were significantly different, $F_r(1, 56) = 0.29$, $p < .05$.

[2] In line with our argument, the two-way interaction (salience × negative reciprocity) on the amount of money was still significant after controlling for negative affect, $b = -.53$, $SE\ b = .26$, $t(53) = -2.07$, $p = .043$. To test if effects of MS could be explained by negative affect, we ran a regression with negative affect and attitude toward negative reciprocity as predictors for the amount of money given. As expected, we found no significant interaction, $b = -.09$, $SE\ b = .26$, $t(54) = .36$, $p = .724$.

[3] We also probed the interaction by testing the effect of salience on money for 1.5 SD above/below the mean of the relevance of the norm of negative reciprocity. Results revealed that for participants 1.5 SD above the mean, the effect of MS on the amount of money given increased compared to 1 SD above the mean, $b = -.98$, $SE\ b = .48$, $t(54) = -2.06$, $p = .044$. For participants 1.5 SD below the mean, no significant effect of MS occurred, $b = .70$, $SE\ b = .45$, $t(54) = 1.57$, $p = .121$.

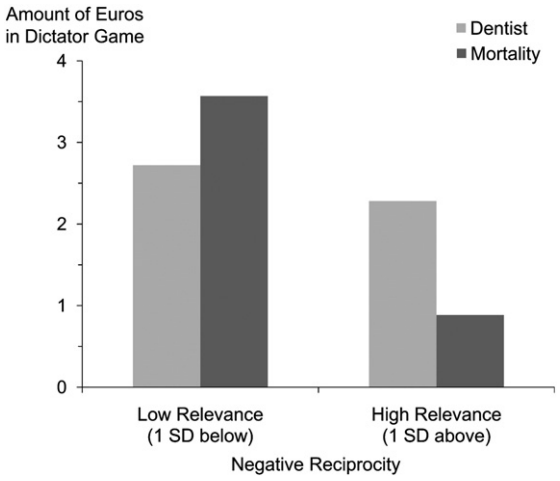


Fig. 2. Means of given money in the dictator game as a function of participants' relevance of the negative norm of reciprocity and MS. Amount of given money ranges from 0 to 10 Euros; lower means express harsher punishment.

reciprocity was activated. This finding also supports the focus theory of normative conduct (Cialdini et al., 1991), stating that whichever norm is salient at the moment is important for people's behavior. Yet simply activating the norm of reciprocity (without MS) failed to increase the amount of the tip, contrary to what the norm focus theory would have suggested. As discussed above, not all norm-focus studies have found effects when simply activating the norm, but did when moderators (e.g., MS) came into play. We speculate that our norm activation is only supposed to induce a weak feeling of obligation to reciprocate a favor (i.e., reading a scenario) compared to an actual favor (Regan, 1971; Rind & Strohmetz, 1999), and therefore did not lead to norm conformity without the motivation of worldview bolstering. Thus, although the norm of reciprocity is assumed to be a very strong one, it seems that sometimes an accompanying motivation is needed to produce norm conformity. Additionally and in line with our findings regarding the moderating effect of MS and the lacking effect in the control group, Fennis et al. (2009) found that a favor led to higher compliance only under specific conditions; in this case, self-regulatory resource depletion.

The result of Study 1 – activating positive reciprocity led to higher tipping under MS – further supports the idea that following the norm is universal and, in general, an important element in people's worldview. Moreover, the result of comparing the standard deviations of positive and negative reciprocity (Study 2) was consistent with our idea that the norm of positive reciprocity is more widespread and universal than the norm of negative reciprocity. Nevertheless, we would expect that the relevance of positive reciprocity also moderates reciprocating a favor under MS.

In Study 2, we investigated the effect of MS on taking revenge (i.e., negative norm of reciprocity). We found support for our hypothesis that in cases of unfavorable treatment, MS increases motivation to retaliate and preconditioned a high relevance of avenging an unfavorable treatment, which resulted in harsher punishment of the favor-denier compared to participants who were not reminded of death. Notably, MS did not lead to a more severe punishment in general, but motivated people to act according to their dispositional value of retaliation following an unfavorable treatment. This is in line with findings on TMT, indicating that MS led to harsher punishment for moral transgressions only when participants believed that the target's behavior was truly immoral (Rosenblatt et al., 1989, Study 2), suggesting that it is the individual's own unique version of the cultural worldview that must be defended against threat. Given that the terroristic attacks of 9/11 induced the fear of death (Pyszczynski, Solomon, & Greenberg, 2003) it seems plausible that – according to our results – people who believed in the value of retaliation used this value as a guide for how to reciprocate terroristic behavior.

The present findings lead to several directions for future research. Literature indicates that the norm of reciprocity can also be used strategically to increase the probability of compliance (so-called door-in-the-face technique; e.g., Cialdini et al., 1975; Cialdini & Ascani, 1976; Dillard, 1991; Eastwick & Gardner, 2009; Mowen & Cialdini, 1980; O'Keefe & Hale, 1998). Taking into account that MS increases the likelihood of following the norm of reciprocity, MS should also increase compliance toward this technique.

Research on TMT further demonstrated that MS increases ingroup identification and ingroup bias (e.g., Castano, Yzerbyt, Paladino, & Sacchi, 2002; Dechesne, Janssen, & Van Knippenberg, 2000; Fritsche, Jonas, & Fankhänel, 2008; Giannakakis & Fritsche, 2011; Harmon-Jones, Greenberg, Solomon, & Simon, 1996; Jonas et al., 2002). That is, under MS, whether the benefactor belongs to a salient in- or outgroup should be highly relevant for reciprocating a favor. Assuming that concessions are perceived as favors (Cialdini et al., 1992), there are important implications for outcomes of negotiations, for example, between politicians of different countries discussing topics related to death (e.g., war).

Furthermore, Jonas and Fritsche (2012) have found that only when showing people that fellow ingroup members were optimistic (vs. pessimistic) that Germany would win the soccer world championship MS increased participants' tendency to shift their attitude likewise. Thus, it seems plausible that under MS, the descriptive norm (i.e., what most people actually do in a particular situation) also plays an important role in a situation of reciprocating a favor or an unfavorable treatment.

In sum, our results support the idea that salient norms are cognitive constructs important for coping with the inevitability of one's own death. We showed that the norm of reciprocity serves this function by indicating that MS increases people's motivation to reciprocate a favor and to act according to their dispositional value of retaliation after an unfavorable treatment.

Acknowledgments

We thank Stefan Pfattheicher and Janin Rössel for their helpful comments on a previous version of this paper.

References

Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions*. Newbury Park, California: Sage.

Arndt, J., Greenberg, J., & Cook, A. (2002). Mortality salience and the spreading activation of worldview-relevant constructs: Exploring the cognitive architecture of terror management. *Journal of Experimental Psychology. General*, *131*, 307–324. http://dx.doi.org/10.1037//0096-3445.131.3.307.

Axelrod, R. (1984). *The evolution of cooperation*. New York: Basic Books.

Burke, B. L., Martens, A., & Faucher, E. H. (2010). Two decades of terror management theory: A meta-analysis of mortality salience research. *Personality and Social Psychology Review*, *14*, 155–195. http://dx.doi.org/10.1177/1088868309352321.

Castano, E., Yzerbyt, V., Paladino, M. P., & Sacchi, S. (2002). I belong, therefore, I exist: Ingroup identification, ingroup entitativity, and ingroup bias. *Personality and Social Psychology Bulletin*, *28*, 135–143. http://dx.doi.org/10.1177/0146167202282001.

Cialdini, R. B., & Ascani, K. (1976). Test of a concession procedure for inducing verbal, behavioral, and further compliance with a request to give blood. *The Journal of Applied Psychology*, *61*, 295–300. http://dx.doi.org/10.1037//0021-9010.61.3.295.

Cialdini, R. B., & Goldstein, N. J. (2004). Social influence: Compliance and conformity. *Annual Review of Psychology*, *55*, 591–621. http://dx.doi.org/10.1146/annurev.psych.55.090902.142015.

Cialdini, R. B., Green, B. L., & Rusch, A. J. (1992). When tactical pronouncements of change become real change: The case of reciprocal persuasion. *Journal of Personality and Social Psychology*, *63*(1), 30–40. http://dx.doi.org/10.1037/0022-3514.63.1.30.

Cialdini, R. B., Kallgren, C. A., & Reno, R. R. (1991). A focus theory of normative conduct: A theoretical refinement and reevaluation of the role of norms in human behavior. In L. Berkowitz (Ed.), *Advances in experimental social psychology*, *Vol. 24*. (pp. 201–234)San Diego, CA: Academic Press. http://dx.doi.org/10.1016/S0065-2601(08)60330-5.

Cialdini, R. B., Vincent, J. E., Lewis, S. K., Catalan, J., Wheeler, D., & Darby, B. L. (1975). Reciprocal concessions procedure for inducing compliance: The door-in-the-face technique. *Journal of Personality and Social Psychology*, *32*, 206–215. http://dx.doi.org/10.1037/h0076284.

Dechesne, M., Janssen, J., & Van Knippenberg, A. (2000). Derogation and distancing as terror management strategies: The moderating role of need for closure and permeability of group boundaries. *Journal of Personality and Social Psychology*, *79*, 923–932. http://dx.doi.org/10.1037//0022-3514.79.6.923.

Dechesne, M., Pyszczynski, T., Arndt, J., Ransom, S., Sheldon, K. M., Van Knippenberg, A., et al. (2003). Literal and symbolic immortality: The effect of evidence of literal immortality on self-esteem striving in response to mortality salience. *Journal of Personality and Social Psychology*, *84*, 722–737. http://dx.doi.org/10.1037/0022-3514.84.4.722.

Dillard, J. P. (1991). The current status of research on sequential-request compliance techniques. *Personality and Social Psychology Bulletin*, *17*, 283–288. http://dx.doi.org/10.1177/0146167291173008.

Eastwick, P. W., & Gardner, W. L. (2009). Is it a game? Evidence for social influence in the virtual world. *Social Influence*, *4*(1), 18–32. http://dx.doi.org/10.1080/15534510802254087.

Edlund, J. E., Sagarin, B. J., & Johnson, B. S. (2007). Reciprocity and the belief in a just world. *Personality and Individual Differences*, *43*, 589–596. http://dx.doi.org/10.1016/j.paid.2007.01.007.

Eisenberger, R., Lynch, P., Aselage, J., & Rohdieck, S. (2004). Who takes the most revenge? Individual differences in negative reciprocity norm endorsement. *Personality and Social Psychology Bulletin*, *30*, 787–799. http://dx.doi.org/10.1177/0146167204264047.

Fennis, B. M., Janssen, L., & Vohs, K. D. (2009). Acts of benevolence: A limited-resource account of compliance with charitable requests. *Journal of Consumer Research*, *35*, 906–924. http://dx.doi.org/10.1086/593291.

Field, A. J. (2004). *Altruistically inclined? The behavioural sciences, evolutionary theory, and the origins of reciprocity.* Ann Arbor: University of Michigan Press.

Fritsche, I., Jonas, E., & Fankhänel, T. (2008). The role of control motivation in mortality salience effects on ingroup support and defense. *Journal of Personality and Social Psychology*, *95*, 524–541. http://dx.doi.org/10.1037/a0012666.

Fritsche, I., Jonas, E., Kayser, D. N., & Koranyi, N. (2010). Existential threat and compliance with pro-environmental norms. *Journal of Environmental Psychology*, *30*, 67–79. http://dx.doi.org/10.1016/j.jenvp. 2009.08.007.

Fromm, E. (2005). *Humanismus als reale Utopie.* Berlin: Ullstein.

Gailliot, M. T., Stillman, T. F., Schmeichel, B. J., Maner, J. K., & Plant, E. A. (2008). Mortality salience increases adherence to salient norms and values. *Personality and Social Psychology Bulletin*, *34*, 993–1003. http://dx.doi.org/10.1177/0146167208316791.

Gallucci, M., & Perugini, M. (2000). An experimental test of a game-theoretical model of reciprocity. *Journal of Behavioral Decision Making*, *13*, 367–389. http://dx.doi.org/10.1002/1099-0771(200010/12)13:4<367::AID-BDM357>3.0.CO;2-9.

Giannakakis, A. E., & Fritsche, I. (2011). Social identities, group norms, and threat: On the malleability of ingroup bias. *Personality and Social Psychology Bulletin*, *37*(1), 82–93. http://dx.doi.org/10.1177/0146167210386120.

Goren, H., & Bornstein, G. (1999). Reciprocation and learning in the intergroup prisoner's dilemma game. In D. V. Budescu, I. Erev, & R. Zwick (Eds.), *Games and human behavior: Essays in honor of Amnon Rapoport* (pp. 299–314). Mahwah, NJ: Erlbaum.

Gouldner, A. (1960). The norm of reciprocity: A preliminary statement. *Journal of Social and Personal Relationships*, *2*, 351–375. http://dx.doi.org/10.2307/2092623.

Greenberg, J., Pyszczynski, T., & Solomon, S. (1986). The cause 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., 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. http://dx.doi.org/10.1037//0022-3514.67.4.627.

Harmon-Jones, E., Greenberg, J., Solomon, S., & Simon, L. (1996). The effects of mortality salience on intergroup bias between minimal groups. *European Journal of Social Psychology*, *26*, 677–681. http://dx.doi.org/10.1002/(SICI)1099-0992(199607)26:4<677::AID-EJSP777>3.3.CO;2-U.

Higgins, E. T., & Bargh, J. E. (1987). Social cognition and social perception. *Annual Review of Psychology*, *38*, 369–425. http://dx.doi.org/10.1146/annurev.psych.38.1.369.

Jonas, E., & Fritsche, I. (2012). Follow the norm! Terror management theory and the influence of descriptive norms. *Social Psychology*, *43*(1), 28–32. http://dx.doi.org/10.1027/1864-9335/a000077.

Jonas, E., Martens, A., Niesta, D., Fritsche, I., Sullivan, D., & Greenberg, J. (2008). Focus theory of normative conduct and terror management theory: The interactive impact of mortality salience and norm salience on social judgment. *Journal of Personality and Social Psychology*, *95*, 1239–1251. http://dx.doi.org/10.1037/a0013593.

Jonas, E., Schimel, J., Greenberg, J., & Pyszczynski, T. (2002). The Scrooge effect: Evidence that mortality salience increases prosocial attitudes and behavior. *Personality and Social Psychology Bulletin*, *28*, 1342–1353. http://dx.doi.org/10.1177/014616702236834.

Kallgren, C. A., Reno, R. R., & Cialdini, R. B. (2000). A focus theory of normative conduct: When norms do and do not affect behavior. *Personality and Social Psychology Bulletin*, *26*, 1002–1012. http://dx.doi.org/10.1177/01461672002610009.

Kanji, G. K. (1999). *100 statistical tests.* London: Sage.

Kasser, T., & Sheldon, K. M. (2000). Of wealth and death: Materialism, mortality salience, and consumption behavior. *Psychological Science*, *11*, 348–351. http://dx.doi.org/10.1111/1467-9280.00269.

Kerr, N. L., Garst, J., Lewandowski, D. A., & Harris, S. E. (1997). That still, small voice: Commitment to cooperate as an internalized versus a social norm. *Personality and Social Psychology Bulletin*, *23*, 1300–1311. http://dx.doi.org/10.1177/01461672972312007.

McGregor, H. A., Lieberman, J. D., Greenberg, J., Solomon, S., Arndt, J., Simon, L., et al. (1998). Terror management and aggression: Evidence that mortality salience motivates aggression against worldview-threatening others. *Journal of Personality and Social Psychology*, *74*(3), 590–605. http://dx.doi.org/10.1037//0022-3514.74.3.590.

Morgan, W. A. (1939). A test for the significance of the difference between the two variances in a sample from a normal bivariate population. *Biometrika*, *31*, 13–19.

Mowen, J. C., & Cialdini, R. B. (1980). On implementing the door-in-the-face compliance technique in a business context. *Journal of Marketing Research*, *27*, 253–258. http://dx.doi.org/10.2307/3150936.

O'Keefe, D. J., & Hale, S. L. (1998). The door-in-the-face influence strategy: A random-effects meta-analytic review. In M. E. Roloff (Ed.), *Communication yearbook 21* (pp. 1–33). Thousand Oaks, CA: Sage.

Perugini, M., Gallucci, M., Presaghi, F., & Ercolani, A. P. (2003). The personal norm of reciprocity. *European Journal of Personality*, *17*, 251–283. http://dx.doi.org/10.1002/per.474.

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

Regan, D. (1971). Effects of a favor and liking on compliance. *Journal of Experimental Social Psychology*, *7*, 627–639. http://dx.doi.org/10.1016/0022-1031(71)90025-4.

Rind, B., & Strohmetz, D. (1999). Effect on restaurant tipping of a helpful message written on the back of customer's checks. *Journal of Applied Social Psychology*, *29*, 139–144. http://dx.doi.org/10.1111/j.1559-1816.1999.tb01378.x.

Rosenblatt, A., Greenberg, J., Solomon, S., Pyszczynski, T., & Lyon, D. (1989). Evidence for terror management theory I: The effects of mortality salience on reactions to those who violate or uphold cultural values. *Journal of Personality and Social Psychology*, *57*, 681–690. http://dx.doi.org/10.1037/0022-3514.57.4.681.

Schlenker, B. R. (1980). *Impression management.* Monterey, CA: Brooks Cole.

Uehara, E. S. (1995). Reciprocity reconsidered: Gouldner's 'moral norm of reciprocity' and social support. *Journal of Social and Personal Relationships*, *12*(4), 483–502. http://dx.doi.org/10.1177/0265407595124001.

Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology*, *53*, 1063–1070. http://dx.doi.org/10.1037//0022-3514.54.6.1063.

Whatley, M. A., Webster, J. M., Smith, R. H., & Rhodes, A. (1999). The effect of a favor on public and private compliance: How internalized is the norm of reciprocity. *Basic and Applied Social Psychology*, *21*, 251–259. http://dx.doi.org/10.1207/S15324834BASP2103_8.

APPENDIX H

Schindler, S., & Reinhard, M.-A. (2014). *When death is compelling: Door-in-the-face compliance under mortality salience.* Manuscript submitted for publication.

When Death is Compelling: Door-in-the-Face Compliance Under Mortality Salience

Word count (main text): 5211

Abstract

Research on terror management theory has found evidence that people under mortality salience strive to live up to activated social norms and values. Recently, research has shown that mortality salience also increases adherence to the norm of reciprocity. Based on this, in the current paper we investigated the idea that mortality salience influences persuasion strategies that are based on the norm of reciprocity. We therefore assume that mortality salience should enhance compliance for a request when using the door-in-the-face technique—a persuasion strategy grounding in the norm of reciprocity. In a hypothetical scenario (Study 1), and in a field experiment (Study 2), applying the door-in-the-face technique enhanced compliance in the mortality salience condition compared to a control group.

Keywords: terror management theory, mortality salience, door-in-the-face technique, norm of reciprocity, persuasion

When Death is Compelling: Door-in-the-Face Compliance Under Mortality Salience

Research on terror management theory (TMT; Greenberg, Pyszczynski, & Solomon, 1986) has found evidence that death reminders affect the impact of persuasive appeals (e.g., Arndt, Solomon, Kasser, & Sheldon, 2004). Thereby, in most studies, predictions were theoretically based on mortality salience (MS) induced motivation to defend one's cultural worldview (e.g., Fransen, Fennis, Pruyn, & Das, 2008; Solomon, Greenberg, Pyszczynski, & Pryzbylinski, 1995). However, TMT research also indicates MS increases people's motivation to live up to salient cultural norms and values (e.g., Jonas et al., 2008). In contrast to previous research on TMT, we focused on a norm-based terror management approach to investigate MS effects on persuasion strategies. Based on recent findings that have revealed that MS increases motivation to adhere to the norm of reciprocity (Schindler, Reinhard, Stahlberg, 2012, 2013), we proposed that MS increases compliance toward the door-in-the-face (DITF) technique—a compliance strategy functioning through a mechanism of reciprocal concessions. Applying the norm-based terror management approach to the DITF technique additionally sheds light on the motivational processes behind the technique, assuming that increased compliance can be driven by people's existential need to feel safe in the face of death.

Theoretical Background of TMT

TMT's theoretical grounding can be traced back to cultural anthropologist Ernest Becker (1973), who postulated that the ability to reflect on our own physical decay conflicts with our strong drive for self-preservation, resulting in an omnipresent potential for paralyzing anxiety. According to TMT (Greenberg et al., 1986; Pyszczynski, Solomon, & Greenberg, 1997; Solomon, Greenberg, & Pyszczynski, 2004), culture offers a means to maintaining psychological equanimity and controlling the ever-present potential terror of death by making people believe that they are valuable beings in a meaningful reality that

contains a set of standards and values. By living up to those standards, people believe that they are valuable beings in this meaningful reality. Correspondingly, the MS hypothesis states that reminding people of their mortality increases their motivation to defend and bolster their cultural worldview, resulting, for instance, in derogating those who violate important cultural standards. In their meta-analysis, Burke, Martens, and Faucher (2010) showed that 80% of a total 277 experiments significantly supported the MS hypothesis.

Mortality Salience Increases Adherence to Social Norms

As cultural standards can be contradictory, resulting in a mixed pattern of behavior to cope with MS, Jonas et al. (2008) connected TMT with the focus theory of normative conduct (Cialdini, Kallgren, & Reno, 1991), stating that norms only influence behavior to the extent that an individual's attention is focused on the norms: Like every cognitive construct (e.g., Higgins & Bargh, 1987), norms have to be salient in attention or high in accessibility. This may be because people dispositionally follow a norm and/or because certain conditions of the situation itself account for the norm's salience. In line with this reasoning, MS was found to increase adherence to a broad range of activated norms, such as prosocial and proself norms, pacifism and conservatism (Jonas et al., 2008), egalitarianism and helpfulness (Gailliot, Stillman, Schmeichel, Maner, & Plant, 2008), proenvironmental norms (Fritsche, Jonas, Kayser, & Koranyi, 2010), and norms of fairness (Jonas & Greenberg, 2012). Moreover, Schindler et al. (2013) argued that the norm of reciprocity is a universal, strongly internalized moral norm (Cialdini & Goldstein, 2004; Gouldner, 1960), and thus following this norm should also serve a terror management function (see also Schindler et al., 2012). In line with this reasoning, Schindler et al. (2013) found evidence that a favor of a server led to higher tipping under MS. Thus, when the norm of reciprocity was activated through the favor, participants under MS were highly motivated to reciprocate it by giving a higher tip.

In sum, research on TMT clearly supports the idea that MS increases a person's motivation to follow social norms, depending on which cultural standards are salient in a specific situation. It seems plausible that these findings can also be transferred to the area of strategic persuasion by MS, influencing the effectiveness of compliance strategies that are based on social norms.

Norm-Based Persuasion: The Door-in-the-Face Technique

A widespread internalized moral principle for social life is the norm of reciprocity (e.g., Cialdini & Goldstein, 2004; Eisenberger, Lynch, Aselage, & Rohdieck, 2004; Perugini, Gallucci, Presaghi, & Ercolani, 2003) and has been discussed as being fundamental for the evolutionary development of human altruism and cooperation (Field, 2004). As Gouldner (1960) stated, reciprocity is "one of the universal 'principal components' of moral codes" (p. 161) that exists in all known societies. The norm prescribes that people should support, and not injure, those who previously supported them (Gouldner, 1960; Uehara, 1995). A great deal of research supports the idea that a favor leads to higher compliance toward a following request of the favor-doer (e.g., Cialdini, Green, & Rusch, 1992; Edlund, Sagarin, & Johnson, 2007; Regan, 1971; Whatley, Webster, Smith, & Rhodes, 1999).

Referring to the power of the reciprocity norm, Edlund, Sagarin, and Johnson (2007) stated that "perhaps the most effective use of reciprocity occurs when there is only one way to reciprocate—the way the persuader wants the target to behave" (p. 590). Appropriately, Cialdini et al. (1975) introduced a persuasive compliance strategy termed DITF technique (see also Bell, Abrahams, Clark, & Schlatter, 1996; Brownstein & Katzev, 1985; Cialdini & Ascani, 1976; Eastwick & Gardner, 2009; Hale & Laliker, 1999; Mowen & Cialdini, 1980; Pendleton & Batson, 1979). To increase compliance with a requested favor, the DITF technique comprises two requests that are issued subsequently: The initial request is chosen to be so large that it is expected to be refused by the respondent. The second request, which

follows upon rejection of the large one, is much smaller and constitutes the critical favor for which compliance is actually sought. The moderation of the previous large request should be perceived as a concession (i.e., favor), consequently activating the norm of reciprocity. Due to the motivation to reciprocate this concession, compliance rates for a critical request issued by means of the DITF technique are therefore expected to be higher as compared to compliance rates achieved through making the critical request only. Cialdini and colleagues (1975) originally tested the effectiveness of the DITF technique in a field experiment in which the experimenter approached students on campus and issued a large request, asking them to volunteer at a juvenile detention center two hours per week for at least two years. Upon refusal of the initial request, the smaller critical request followed (i.e., volunteering for two hours only). Participants in the control condition were solely faced with the critical request (critical-request-only condition). Results indicated that compliance rates in the DITF condition were three times as high as compared to the critical-request-only condition. In further studies, the assumed process by activating the norm of reciprocity was supported by ruling out alternative explanations, such as a perceived contrast effect between the large and the small request (see also Lecat, Hilton, & Cranco, 2009) or perceived tenaciousness of the requester (Cialdini et al., 1975, Study 3).

The effectiveness of the DITF strategy is evidenced by several meta-analyses (Dillard, 1991; Dillard, Hunter, & Burgoon, 1984; Fern, Monroe, & Avilla, 1986; O'Keefe & Hale, 1998) yielding overall effect sizes ranging between r = .10 and r = .25. Additionally, research has revealed important moderating factors for a successful performance of the DITF technique (e.g., Feeley, Anker, & Aloe, 2012). Schwarzwald, Raz, and, Zvibel (1979), for instance, found that the initial large request needs to be perceived as reasonable in order to elicit the DITF effect. An exaggerated initial request, in turn, would bring the requester into discredit and therefore lead to lower compliance rates. Research has further indicated DITF

compliance to be moderated by dispositional factors. Bell et al. (1996), for instance, found that the DITF technique only increased compliance for participants with high dispositional exchange orientation. Additionally, evidence for the role of situational factors on DITF compliance was reported by Carter-Sowell, Chen, and Williams (2008), showing that effectiveness of the DITF technique increased when participants had been ostracized during a game compared to when they had been included. The authors reasoned that ostracized individuals change their behaviors to be readmitted into the group, even if it means becoming excessively socially susceptible to influence.

The Present Research

According to research on TMT, people under MS strive to live up to social norms that are activated by the situation. Based on recent findings showing that MS increased the motivation of adhering to the norm of reciprocity (Schindler et al., 2012, 2013), we assumed that MS should enhance compliance for a request when using the DITF technique—a persuasion strategy that was shown to be grounded in the norm of reciprocity. Study 1 included a typical MS manipulation and a hypothetical scenario to assess participants' behavioral intentions of buying a newspaper. Study 2 was a field experiment in which flyers were used to induce MS, and actual donation behavior was assessed. In both studies, we hypothesized that DITF compliance should be increased after MS compared to a control salience condition.

Study 1

In this study, we focused on participants' behavioral intentions of complying with the DITF technique under MS. In a fictitious scenario (cf. Tusing & Dillard, 2000), participants in the DITF condition were asked to subscribe to a newspaper for two years. After refusing, they were asked about buying just today's newspaper edition. This smaller request should be perceived as a concession that should activate the norm of reciprocity. It was assumed that

participants in the MS condition should be especially motivated to fulfill this norm and should therefore indicate higher probability of buying the newspaper compared to a control salience condition.

Method

Subjects and design. The hypothesis was tested in an Internet study.[1] Participants in this study included 75 Germans (41 women and 34 men; $M_{age} = 28.97$, $SD = 7.06$), of whom 30 reported being students and 45 reported being employed. They were randomly assigned to the experimental conditions in a 2 (salience: MS vs. dental pain) × 2 (compliance strategy: DITF vs. critical-request-only) between-subjects factorial design.

Materials and procedure. Participants were told that the study would be about personality and decision making. After participants filled out the demographic measures, they received the MS or the dental pain control treatment. The MS condition consisted of two open-ended short-answer questions that asked participants to write about the emotions that the thought of their own death aroused in them and to jot down what they thought would happen to them as they physically die. This manipulation has typically been used in research on TMT (Burke et al., 2010). Participants in the control condition had to write about dental pain. When using such explicit death primes, a distractor is necessary to elicit effects of worldview defense and bolstering (Arndt, Greenberg, & Cook, 2002). Therefore, as in many studies on TMT (Burke et al., 2010), participants filled out 60 items of the Expanded Form of the Positive and Negative Affect Schedule (PANAS-X; Watson & Clark, 1992). This self-report inventory asks participants to rate the extent to which they are currently experiencing a number of different feelings. Then participants were instructed that in the following part they would receive a description of a scenario and that it would be important to read it carefully in order to have a clear, realistic picture of it. The scenario in the DITF condition read as follows:

> Imagine you are walking by yourself through the city and being approached at a booth of the "Süddeutsche Zeitung".[2] After a short talk, you find out that the person gets a fee for every sold exemplar and every newspaper subscription. Now, the person asks if you are interested in a newspaper subscription of two years.

Participants are given two possibilities to answer: (a) "Yes, I would subscribe to this newspaper for two years" or (b) "No, thanks".[3] If they refused the subscription, they received the critical request: "Acknowledging your answer, the person asks if you want to buy today's newspaper edition." On a 7-point Likert-type scale ranging from 1 (*very unlikely*) to 7 (*very likely*), participants were asked about the likelihood of buying the newspaper. Finally, participants were thanked and debriefed by being provided with information about the study's purpose.

Results

We first checked for an effect of sex on buying probability and found none, $F < 1$. Additionally, we tested whether the MS treatment had any effect on self-reported mood as measured by the PANAS-X. This scale contains subscales for positive and negative mood as well as 11 other specific mood subscales. Because items in the positive and negative mood scales also appear in the other subscales, we conducted one factorial (salience condition) analyses of variance (ANOVAs) on the positive and negative mood scales and one factorial (salience condition) multivariate analysis of variance on the 11 specific subscales. Consistent with prior research on TMT, there were no significant effects of any of these analyses, all *p*s > .137.

To test our hypothesis, we ran an ANOVA with salience condition (MS vs. dental pain) and compliance strategy (DITF vs. critical-request-only) as independent variables and the probability of buying a newspaper as the dependent variable. Results indicated no main effects, both *p*s > .395. However, as predicted, analysis yielded a significant interaction

effect between salience condition and compliance strategy on the likelihood of buying the newspaper, $F(1, 71) = 4.75$, $p = .033$, $\eta^2_p = .06$. Analyses of the pattern of means showed that participants in the DITF condition would buy the newspaper significantly more likely under MS ($M = 3.77$, $SD = 2.39$) than in the control salience condition ($M = 2.40$, $SD = 1.43$), $F(1, 71) = 4.46$, $p = .038$, $d = .71$ (see Figure 1). For participants in the critical-request-only condition, no effect salience condition occurred, $F < 1$. To strengthen our argument that activating the norm of reciprocity should lead to higher DITF compliance under MS, we additionally analyzed the influence of compliance strategy under MS. Results revealed that participants in the MS condition reported buying the newspaper significantly more likely in the DITF condition compared to the critical-request-only condition ($M = 2.39$, $SD = 2.09$), $F(1, 71) = 4.32$, $p = .041$, $d = .62$. No effect of compliance strategy on probability of buying the newspaper in the salience control condition occurred, $F < 1$.

Discussion

In this study, we found evidence for our hypothesis that using the DITF technique increases compliance intentions after MS compared to the control salience condition. When participants first refused to subscribe to the newspaper for two years, they afterwards indicated a higher likelihood of buying today's edition when mortality was made salient. Notably, there was no main effect of salience manipulation, indicating that participants did not comply with the critical request just because of MS: Using the DITF technique compared to the critical-request-only condition significantly increased compliance when participants had been confronted with their mortality. This is in line with the reciprocal concession approach, stating that the second, smaller request is perceived as a concession (i.e., a favor) which should be reciprocated corresponding to the norm of reciprocity. There was, however, no main effect of compliance strategy. As meta-analyses revealed, the effect sizes of the DITF technique are not very large (ranging between r = .10 and r = .25; e.g., Dillard, 1991;

O'Keefe & Hale, 1998). Thus, our finding is not completely unexpected, especially considering that in the literature certain moderators for the effectiveness of the DITF technique have been found (e.g. Bell et al., 1996). Given that this experiment was based on a hypothetical scenario, we additionally tested our hypothesis on actual behavior in a field experiment.

Study 2

Although hypothetical scenarios as in Study 1 are commonly used and behavioral intentions are often good predictors for behavior (e.g., Ajzen, 2005), in Study 2 we tested the effect of MS and the DITF technique on actual donations to a social charity organization. In a field study, we used flyers to induce MS, a method that was already successfully applied by Hirschberger, Ein-Dor, and Almakias (2008). We predicted that the average amount of donated money is higher when applying the DITF technique after they received an MS flyer compared to when they received a control flyer.

Method

Subjects and design. Participants in this study included 122 students (60 women and 62 men).[4] They were randomly approached by a research assistant who gave them a flyer as they were walking alone through the campus of a German university. Then, another research assistant asked participants for a donation by using either the DITF technique or by expressing only the critical request. Thus, the study followed a 2 (salience: MS vs. control) × 2 (compliance strategy: DITF vs. critical-request-only) between-subjects factorial design.

Materials and procedure. The study was conducted in a central location on the university campus. Parallel to a successful MS manipulation by Hirschberger et al. (2008), a research assistant handed out the MS and the control flyer over a time-lag of thirty minutes. The MS flyer contained the bold words "Death-Thoughts?!" whereas the control flyer contained the words "TV-Consumption?!" In both flyer conditions, a sentence in a very

small font size was written below the bold words: “The chair of social psychology does research about effects of situational factors and is always looking for new participants. If you are interested, please contact us.” This sentence was followed by an email-address of a research assistant. Additionally, on the MS flyer, on the left side of the flyer and above the text, ran two bold lines that crossed each other in the left, upper corner of the flyer, building a kind of cross. On the control flyer, the two lines did not cross each other, but stopped where they touched each other.

About fifteen meters away from the first research assistant, a second research assistant who was blind to flyer conditions was waiting with a clipboard, recording the time when flyer conditions changed and watching if participants took a look at the flyers.[5] Following a randomized order of compliance strategy conditions, the second research assistant applied either the DITF technique or expressed only the critical request. In the DITF condition, the research assistant said the following:

> Hello, I am working for Big Brothers, Big Sisters. That's a charity organization supporting children and adolescents with a mentoring program where grown-ups take responsibility for a child from their surrounding area. We then create adequate tandems, wherein participants meet up with each other on a weekly basis in order to spend some time together. What they exactly do during their get-togethers is up to them. Momentarily we are looking for people who are willing to participate. In order to ensure the child will benefit from the program, you would have to enroll for at least one year though. Would you be willing to participate for one year meeting up with a child?

If participants refused to participate in the program, they were told that they also can support Big Brothers, Big Sisters financially and were asked for a donation of at least 0.50 Euro.[6] In the critical-request-only condition, the research assistant also introduced the

mentoring program, but only asked for a donation of at least 0.50 Euro without requesting participation for one year. After having made their decision, participants were debriefed and thanked. Finally, the research assistant recorded participants' sex, compliance strategy condition, donation behavior, and amount of donation.

Results

Overall, 26% of all participants (n = 32) donated an average amount of 0.59 Euro (approximately $0.76 US). The amounts of donated money ranged from 0.35 Euro to 1.50 Euro. There was no effect of sex, $F < 1$. The amounts of donated money ranged from 0.35 Euro to 1.50 Euro. There was no effect of sex, $F < 1$. Therefore, a 2 x 2 ANOVA was conducted to analyze the total amount of donated money (i.e., compliance intensity) as a function of salience condition and compliance strategy. Results indicated no main effects, both ps > .332. However, as predicted, analysis yielded a significant interaction effect between the two factors, $F(1, 118) = 4.52$, $p = .036$, $\eta^2_p = .04$. Analyses of the pattern of means showed that participants in the DITF condition gave an higher amount on average under MS ($M = 0.25$, $SD = 0.37$) than in the control salience condition ($M = 0.11$, $SD = 0.25$), $F(1, 118) = 3.68$, $p = .058$, $d = .45$ (see Figure 2). Parallel to the analyses in Study 1, and to further support our idea that activating the norm of reciprocity should lead to higher DITF compliance under MS, we additionally analyzed the influence of compliance strategy under MS. Results revealed that participants in the MS condition donated a higher amount on average in the DITF condition compared to the critical-request-only condition ($M = 0.09$, $SD = 0.20$), $F(1, 118) = 5.03$, $p = .027$, $d = .55$. No effect occurred for compliance strategy on amount of donated money in the control condition, $p > 270$.

As our compliance measurement enabled us to treat compliance also a dichotomous variable (compliance probability: donation vs. no donation), we additionally tested our hypothesis by using a binary logistic regression. We entered the two dummy-coded

independent variables salience condition (MS = 1, Control = 0) and compliance strategy (DITF = 1, Critical-Request-Only = 0) in a first analytical step. In a second step, the interaction term was added.[7] Both analyses revealed no main effects, all *p*s > .278. However, both analyses yielded the predicted two-way interaction, $b(1, N = 122) = 1.56$, $p = .075$, odds ratio = 4.77. For supplemental analysis of the interaction, the recentering procedure suggested by J. Cohen, Cohen, West, & Aiken (2003) was used. The influence of MS on donation probability for the DITF condition could be seen when DITF was coded as 0 and the critical-request-only condition as 1. Parallel to the pattern of means of amount of donation, donation probability of participants in the MS condition (40 %) was higher than in the control salience condition (16.6 %), $b(1, N = 122) = 1.20$, $p = .050$, odds ratio = 3.33. Coding the critical-request-only condition as 0 revealed no significant effect of MS (MS = 18.2 % vs. Control = 24.1 %), $b(1, N = 122) = –0.46$, $p = .478$, odds ratio = 0.62. We additionally analyzed the influence of compliance strategy under MS by coding MS as 0 and control salience condition as 1. Results revealed that participants in the MS condition were more likely to donate in the DITF condition compared to the critical-request-only condition (18.2 %), $b(1, N = 122) = 1.10$, $p = .061$, odds ratio = 3.00. No effect occurred in the control salience condition, $p > .478$.

Discussion

The results provide support for our hypothesis that using the DITF technique increases behavioral compliance after MS compared to the control salience condition. Participants who first refused to participate for one year in the program of Big Brothers, Big Sisters donated more than twice as much on average in the MS condition compared to the control salience condition. As in Study 1, there was no main effect of salience manipulation, indicating that participants did not comply with the critical request just because of MS, but only when the DITF technique was used. Also, there was no main effect of compliance strategy, indicating

the DTIF technique failed to increase compliance compared to the critical-request-only condition—until MS came into play.

General Discussion

Previous research on TMT showed that persuasive appeals are affected by MS induced motivation to defend one's worldview (e.g., Arndt et al., 2004). In contrast, we focused on a norm-based terror management approach (e.g., Jonas et al., 2008) by investigating the idea that MS increases compliance toward the DITF technique, assuming this technique to be grounded in the norm of reciprocity (e.g., Cialdini et al., 1975; Mowen & Cialdini, 1980). In two studies, we found empirical support for this idea: In Study 1, participants under MS (compared to a control group) indicated a higher likelihood of buying a newspaper when they previously refused to subscribe to the newspaper for two years. In Study 2, participants under MS (compared to a control group) donated more than twice as much on average to a charity organization when they previously refused to participate for one year in the charity's program. According to the original idea of DITF, we interpret this finding according to the reciprocal concession approach: The second, smaller request should be perceived as a concession which should be reciprocated especially under MS because it increases the motivation to fulfil the norm of reciprocity (Schindler et al., 2012, 2013).

Regarding the underlying processes of the DITF technique, literature mentions alternative explanations beside the reciprocal concession approach (e.g., Feeley et al., 2012; Turner, Tamborini, Limon, & Zuckerman-Hyman, 2007). Primarily, Tusing and Dillard (2000) proposed a social responsibility explanation by suggesting that refusing the large request violates the norm to help others, leading to feelings of guilt, which further increases motivation to comply with the second request to bring one back in line with socially shared standards (see also O'Keefe & Figge, 1997, 1999). Furthermore, violating the norm of helping by refusing the large request "may serve to make this norm salient in cases where the

norm is inactive" (Feeley et al., 2012, p. 337). Accordingly, one might speculate that when using the DITF, compliance increases under MS due to increased motivation to follow the activated norm of helping, which would also be in line with previous research on TMT, indicating that MS increases prosocial attitudes and behavior, especially when they are in focal (e.g., Gailliot et al., 2008; Schindler, Reinhard, Stahlberg, & Len, in press). Although we are not able to directly rule out this possibility with the present studies, there is at least some evidence supporting the reciprocal concession account, namely the role of contexts in which the DITF technique was used. According to Feeley et al. (2012), the reciprocal concessions approach would predict DITF effects to hold across communication medium and for various causes (i.e., prosocial vs. marketing), whereas the social responsibility approach of Tusing and Dillard (2000) should vary as the guilty feeling of not helping is stronger when provoked by a worthy cause. In line with the reciprocal concession approach, we provided evidence that MS increases DITF compliance in a marketing context (Study 1) as well in a prosocial context (Study 2).

Interestingly, the latest meta-analysis on the DITF technique (Feeley et al., 2012) found the baseline level of the target request to play a crucial moderating role for the technique's effectiveness (with low baseline compliance leading to higher effectiveness). The authors concluded that the social responsibility explanation, rather than the reciprocal concession approach, appears to be the most viable one for this finding. Although we mainly derived our hypothesis from the latter approach, both approaches plausibly explain increased compliance in the DITF condition under MS. Moreover, besides a norm-based explanation, it seems possible, for example, that after two unpleasant experiences (i.e., exposure to mortality and rejecting another person's primary request), it may be hard to tolerate another unpleasant and embarrassing outcome. People may thus comply with a minor secondary request because this provides an easy way out of an embarrassing situation. However, at least two

experiments (Cialdini et al., 1975) directly contradict this and also the social responsibility approach. In Study 2, Cialdini et al. (1975) included a two requester control condition in which the critical request was made by a different person, compared to the DITF technique, where the same person makes the large and the critical request. In Study 3, they included an experimental condition in which the initial request was of equivalent size as the second request to rule out the possibility that the technique's effectiveness is due to people's motivation to appear generally prosocial or helpful. Results indicated that none of these control strategies produced higher compliance than the critical-request-only strategy. Thus, those designs are good examples for fruitful future research in addressing the open issue of motivational and cognitive processes underlying the DITF technique with regard to the influence of MS.

Whereas Study 1 and 2 provided support for our interaction hypothesis, in both studies, the DITF technique failed to increase compliance without MS. In their meta-analysis, Feeley et al. (2012) found a significant effect of the DITF technique on verbal compliance ($k = 78$, $r = .126$), but a nonsignificant effect for behavioral compliance ($k = .39$, $r = .052$). The latter finding is in line with results of Study 2 in which actual donation behavior was assessed. According to the former finding, however, the missing main effect on buying intentions (i.e., verbal compliance) in Study 1 is a complicating factor. Looking at the studies included in the meta-analysis reveals, however, that no study used a fictitious scenario. According to research on cooperation in social dilemmas (e.g., Axelrod, 1984) which suggests that cooperation decreases when decisions are made anonymously, we speculate that reading the scenario only induced a weak feeling of social pressure to comply with a reciprocal concession, compared to an actual face-to-face situation like in most other studies. Thus, although the technique's effectiveness was proven in many studies, sometimes moderators are necessary. Beyond that, many studies on norm-focus failed to find effects of

simply activating the norm, but have found an effect only when moderators came into play (e.g., Jonas et al., 2008, Studies 1 and 2; Kallgren, Reno, & Cialdini, 2000, Study 1; Schindler et al., 2013, Study 1). Thus, besides simple norm activation, sometimes an accompanying motivation is needed to increase norm adherence.

In sum, our findings contribute to existing literature mainly in two ways: First, previous research on TMT and persuasive appeals has mainly focused on worldview defense as the underlying motivation. However, we applied a norm-based terror management perspective to explain possible MS effects of self-esteem striving on persuasiveness. Second, our work extends previous research on the DITF technique by providing evidence that an existential threat (i.e., MS) constitutes a relevant factor for increasing its success. This perspective offers new insights on motivational aspects of the DITF technique as it implies that DITF compliance can serve an existential function when dealing with one's own death.

References

Ajzen, I. (2005). *Attitudes, personality, and behavior* (2nd ed.). Milton-Keynes, England: Open University Press (McGraw-Hill).

Arndt, J., Greenberg, J., & Cook, A. (2002). Mortality salience and the spreading activation of worldview-relevant constructs: Exploring the cognitive architecture of terror management. *Journal of Experimental Psychology: General*, *131*, 307–324. doi:10.1037//0096-3445.131.3.307

Arndt, J., Solomon, S., Kasser, T., & Sheldon, K. (2004). The urge to splurge: A terror management account of materialism and consumer behavior. *Journal of Consumer Psychology*, *14*, 198–212.

Axelrod, R. (1984). *The Evolution of Cooperation*. New York: Basic Books.

Becker, E. (1973). The denial of death. New York: Free Press.

Bell, R. A., Abrahams, M. F., Clark, C. L., & Schlatter, C. (1996). The door-in-the-face compliance strategy: An individual difference analysis of two models in an AIDS fundraising context. *Communication Quarterly*, *44*, 107–124.

Brownstein, R. J., & Katzev, R. D. (1985). The relative effectiveness of three compliance techniques in eliciting donations to a cultural organization. *Journal of Applied Social Psychology*, *15*, 564–574.

Burke, B. L., Martens, A., & Faucher, E. H. (2010). Two decades of terror management theory: A meta-analysis of mortality salience research. *Personality and Social Psychology Review*, *14*, 155–195.

Carter-Sowell, A. R., Chen, Z., & Williams, K. D. (2008). Ostracism increases social susceptibility. *Social Influence*, *3*, 143–153.

Cialdini, R. B., & Ascani, K. (1976). Test of a concession procedure for inducing verbal, behavioral, and further compliance with a request to give blood. *Journal of Applied Psychology*, *61*, 295–300.

Cialdini, R. B., & Goldstein, N. J. (2004). Social influence: Compliance and conformity. *Annual Review of Psychology*, *55*, 591–621.

Cialdini, R. B., Green, B. L., & Rusch, A. J. (1992). When tactical pronouncements of change become real change: The case of reciprocal persuasion. *Journal of Personality and Social Psychology*, *63*, 30–40.

Cialdini, R. B., Kallgren, C. A., & Reno, R. R. (1991). A focus theory of normative conduct: A theoretical refinement and reevaluation of the role of norms in human behavior. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 24, pp. 201–234). San Diego, CA: Academic Press.

Cialdini, R. B., Vincent, J. E., Lewis, S. K., Catalan, J., Wheeler, D., & Darby, B. L. (1975). Reciprocal concessions procedure for inducing compliance: The door-in-the-face technique. *Journal of Personality and Social Psychology*, *32*, 206–215.

Cohen, J., Cohen, P., West, S. G., & Aiken, L. S. (2003). *Applied multiple regression/correlation analysis for the behavioral sciences.* Mahwah, N. J.: Lawrence Erlbaum.

Dillard, J. P. (1991). The current status of research on sequential-request compliance techniques. *Personality and Social Psychology Bulletin*, *17*, 283–288.

Dillard, J. P., Hunter, J. E., & Burgoon, M. (1984). Sequential-request persuasive strategies: Meta-analysis of foot-in-the-door and door-in-the-face. *Human Communication Research*, *10*, 461–488.

Eastwick, P. W., & Gardner, W. L. (2009). Is it a game? Evidence for social influence in the virtual world. *Social Influence*, *4*, 18–32.

Edlund, J. E., Sagarin, B. J., & Johnson, B. S. (2007). Reciprocity and the belief in a just world. *Personality and Individual Differences*, *43*, 589–596.

Eisenberger, R., Lynch, P., Aselage, J., & Rohdieck, S. (2004). Who takes the most revenge? Individual differences in negative reciprocity norm endorsement. *Personality and Social Psychology Bulletin*, *30*, 787–799.

Feeley, T. H., Anker, A. E., & Aloe, A. M. (2012). The door-in-the-face persuasive message strategy: A meta-analysis of the first 35 years. *Communication Monographs*, *79*, 316–343.

Fern, E. F., Monroe, K. B., & Avila, R. A. (1986). Effectiveness of multiple request strategies: A synthesis of research results. *Journal of Marketing Research*, *23*, 144–152.

Field, A. J. (2004). *Altruistically inclined? The behavioural sciences, evolutionary theory, and the origins of reciprocity.* Ann Arbor: University of Michigan Press.

Fransen, M. L., Fennis, B. M., Pruyn, A. T. H., & Das, E. (2008). Rest in peace? Brand-induced mortality salience and consumer behavior. *Journal of Business Research*, *61*, 1053–1061.

Fritsche, I., Jonas, E., Kayser, D. N., & Koranyi, N. (2010). Existential threat and compliance with pro-environmental norms. *Journal of Environmental Psychology*, *30*, 67–79.

Gailliot, M. T., Stillman, T. F., Schmeichel, B. J., Maner, J. K., & Plant, E. A. (2008). Mortality salience increases adherence to salient norms and values. *Personality and Social Psychology Bulletin*, *34*, 993–1003.

Gosling, S. V., Srivastava, S., & John O. P. (2004). Should we trust web-based studies? A comparative analysis of six preconceptions about Internet questionnaires. *American Psychologist*, *59*, 93–104.

Gouldner, A. (1960). The norm of reciprocity: A preliminary statement, *Journal of Social and Personal Relationships*, *2*, 351–375.

Greenberg, J., Pyszczynski, T., & Solomon, S. (1986). The cause 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.

Hale, J. L., & Laliker, M. (1999). Explaining the door-in-the-face: Is it really time to abandon reciprocal concessions? *Communication Studies*, *50*, 203–210.

Higgins, E. T., & Bargh, J. E. (1987). Social cognition and social perception. *Annual Review of Psychology*, *38*, 369–425.

Hirschberger, G., Ein-Dor, T., & Almakias, S. (2008). The self-protective altruist: Terror management and the ambivalent nature of prosocial behavior. *Personality and Social Psychology Bulletin*, *34*, 666–678.

Jonas, E., & Greenberg, J. (2012). Generosity, greed, norms, and death – Differential effects of mortality salience on charitable behavior. *Journal of Economic Psychology*, *35*, 47–57.

Jonas, E., Martens, A., Niesta, D., Fritsche, I., Sullivan, D., & Greenberg, J. (2008). Focus theory of normative conduct and terror management theory: The interactive impact of mortality salience and norm salience on social judgment. *Journal of Personality and Social Psychology*, *95*, 1239–1251.

Kallgren, C. A., Reno, R. R., & Cialdini, R. B. (2000). A focus theory of normative conduct: When norms do and do not affect behavior. *Personality and Social Psychology Bulletin*, *26*, 1002–1012.

LeCat, B., Hilton, D. J., & Crano, W. D. (2009). Group status and reciprocity norms: Can the door-in-the-face effect be obtained in an out-group context? *Group Dynamics: Theory, Research, & Practice*, *13*, 178–189.

Mowen, J. C., & Cialdini, R. B. (1980). On implementing the door-in-the-face compliance technique in a business context. *Journal of Marketing Research*, *27*, 253–258. doi:10.2307/3150936

O'Keefe, D. J., & Figge, M. (1997). A guilt-based explanation of the door-in-the-face influence strategy. *Human Communication Research*, *24*, 64–81.

O'Keefe, D. J., & Figge, M. (1999). Guilt and expected guilt in the door-in-the-face technique. *Communication Monographs*, *66*, 312–324.

O'Keefe, D. J., & Hale, S. L. (1998). The door-in-the-face influence strategy: A random-effects meta-analytic review. In M. E. Roloff (Ed.), *Communication yearbook 21* (pp. 1–33). Thousand Oaks, CA: Sage.

Pendleton, M. G., & Batson, C. D. (1979). Self-presentation and the door-in-the-face technique for inducing compliance. *Personality and Social Psychology Bulletin*, *5*, 77–81.

Perugini, M., Gallucci, M., Presaghi, F., & Ercolani, A. P. (2003). The personal norm of reciprocity. *European Journal of Personality*, *17*, 251–283.

Pyszczynski, T., Solomon, S., & Greenberg, J. (1997). Why do we need what we need? A terror management perspective on the roots of human social motivation. *Psychological Inquiry, 8*,1–20.

Regan, D. (1971). Effects of a favor and liking on compliance. *Journal of Experimental Social Psychology*, *7*, 627–639.

Schindler, S., Reinhard, M.-A., & Stahlberg, D. (2012). Mortality salience increases personal relevance of the norm of reciprocity. *Psychological Reports*, *111*, 565–574.

Schindler, S., Reinhard, M.-A., & Stahlberg, D. (2013). Tit for tat in the face of death: The effect of mortality salience on reciprocal behavior. *Journal of Experimental Social Psychology*, *49*, 87–92.

Schindler, S., Reinhard, M.-A., Stahlberg, D., & Len, A. (in press). Quid pro quo: The effect of individuals' exchange orientation on prosocial behavior and the moderating role of mortality salience. *Social Influence.*

Schwarzwald, J., Raz, M., & Zvibel, M. (1979). The applicability of the door-in-the face technique when established behavioral customs exist. *Journal of Applied Social Psychology*, *9*, 576–586.

Solomon, S., Greenberg, J., & Pyszczynski, T. (2004). The cultural animal: Twenty years of terror management theory and research. In J. Greenberg, S. L., Koole, & T. Pyszczynski (Eds.), *Handbook of experimental existential psychology* (pp.13–34). New York: Guilford.

Solomon, S., Greenberg, J., Pyszczynski, T., & Pryzbylinski, J. (1995). The effects of mortality salience on personally-relevant persuasive appeals. *Social Behavior and Personality*, *23*, 177–190.

Turner, M. M., Tamborini, R., Limon, M. S., & Zuckerman-Hyman, C. (2007). The moderators and mediators of door-in-the-face requests: Is it a negotiation or helping experience? *Communication Monographs*, *74*, 333–356.

Tusing, K. J., & Dillard, J. P. (2000). The psychological reality of the door-in-the-face: It's helping, not bargaining. *Journal of Language and Social Psychology*, *19*, 5–25.

Uehara, E. S. (1995). Reciprocity reconsidered: Gouldner's 'moral norm of reciprocity' and social support, *Journal of Social and Personal Relationships*, *12*(4), 483–502.

Watson, D., & Clark, L. A. (1992). Affects separable and inseparable: On the hierarchical arrangement of the negative affects. *Journal of Personality and Social Psychology*, *62*, 489–505.

Whatley, M. A., Webster, J. M., Smith, R. H., & Rhodes, A. (1999). The effect of a favor on public and private compliance: How internalized is the norm of reciprocity. *Basic and Applied Social Psychology*, *21*, 251–259.

Footnotes

[1] Research has indicated that Internet methods are typically consistent with the effects from studies using traditional methods (Gosling, Vazire, Srivastava, & John, 2004).

[2] The "Süddeutsche Zeitung" (literally translated: "South German Newspaper") is one of the largest German national subscription daily newspaper.

[3] All participants refused to subscribe to the newspaper.

[4] Of 127 participants, two participants agreed with the first request of the DITF technique and three participants did not have any money with them. All five participants were excluded from the sample.

[5] Participants were only asked for a donation if they took a flyer and also had a look at it.

[6] A pretest on baseline compliance (critical-request-only condition) revealed that only three participants out of 43 (about 7 percent) donated when asking about a donation without mentioning a specific amount. Two participants donated 1.50 Euro and one donated 2 Euro. In order to avoid a floor-effect in compliance, we decided to ask for an amount of at least 0.50 Euro to donate.

[7] Two participants donated less than the requested 0.50 Euro and were therefore categorized as noncompliant.

Figure 1. Means of compliance probability as a function of compliance strategy and salience condition. Values range from 1 to 7; higher means express higher compliance probability.

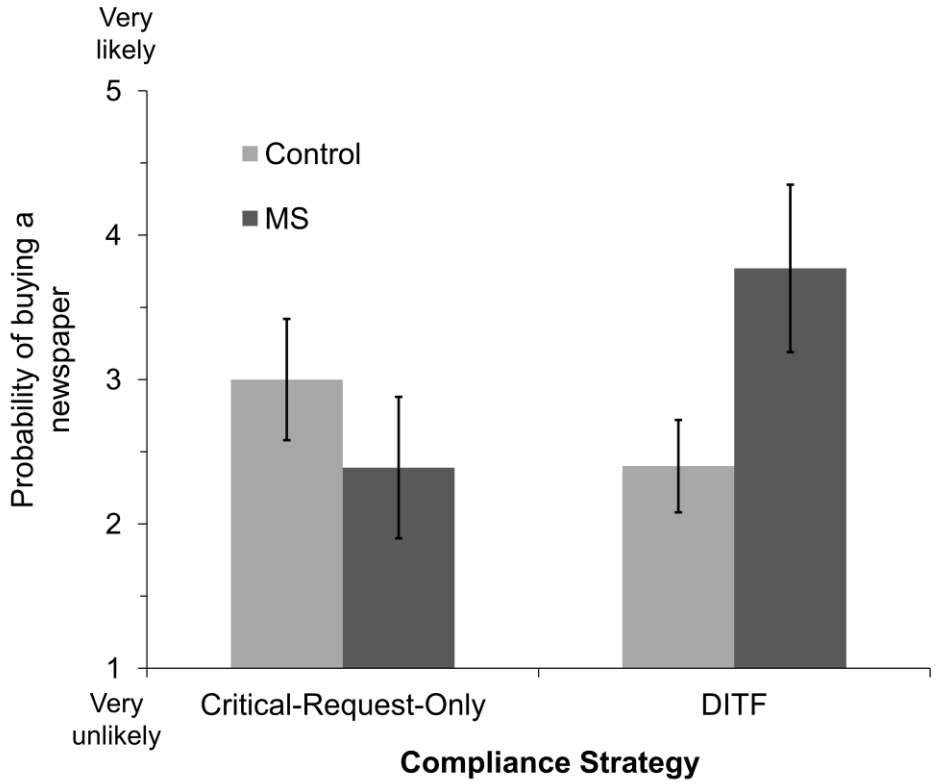


Figure 2. Average amount of donated money as a function of compliance strategy and salience condition.