The Role of Mortality Awareness in Hero Identification

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Abstract

Three studies examine hypotheses derived from terror management theory to investigate the relationship between mortality concerns and hero identification. Study 1 found reminders of death, followed by a distraction task and a self-prime, led to greater inclusion of heroes in the self. Study 2 found that writing about a personal hero, but not other's heroes or acquaintances, led to lower death-thought accessibility after being reminded of mortality. Finally, Study 3 found that after death reminders, participants led to identify with a hero exemplifying traits of legacy and/or sacrifice showed lower death thought accessibility. Findings are discussed as generative for heroism research, informing a previously overlooked motivation underlying hero identification and the existential function of such identification.

Keywords: heroism, terror management, identification, death thoughts.

The Role of Mortality Awareness in Hero Identification

The classic story of *Don Quixote* (Cervantes, 1612) depicts an older gentleman living in the plains of La Mancha, Spain. He takes to reading books about heroes of days gone by. After excessively consuming these tales of heroes, the 'Man from La Mancha' begins to see himself as sharing in their heroism before opting to journey out into the world to forge his own heroic story. Although not the most mentally balanced of protagonists, with Don Quixote nearing the end of his life and facing various illnesses, his story invites us to consider the potential role of existential concerns about life and death in hero identification.

Whether taking the perspective of the hero in a novel, crafting a videogame avatar so the protagonist resembles oneself, or being born on the same day as a cherished sports superstar - there seems to be something appealing about sharing an identity with our heroes. Indeed, people tend to include the traits they associate with their heroes into their own sense of self (Sullivan & Ventor, 2005). However, little is known about the motivations that underlie such identification. The present research draws from terror management theory (TMT; Greenberg, Pyszczynski, & Solomon, 1986) to examine (1) whether hero identification is spurred by mortality concerns, and (2) whether hero identification functions to manage existential concerns tethered to the awareness of death.

Terror management theory

Initially inspired by the works of Ernest Becker (e.g., Becker, 1973), TMT posits conscious and non-conscious awareness of mortality engage different motivational orientations aimed at buffering the threat associated with mortality-related cognition (Pyszczynski, Greenberg, & Solomon, 1999). Conscious thoughts of death are argued to instigate responses focused on removing death thoughts from focal attention. In contrast, subtle or fleeting thoughts

of mortality are thought to motivate people to strive for cultural value. Culture, in turn, confers existential security by allowing individuals to feel a part of something more enduring than the self. This, in turn, enables them to live with relative equanimity in the face of knowledge that life will, at least physically, end. Culture also provides standards of value that enable people to maintain self-esteem, or the sense of being a significant contributor to the cultural meaning system.

TMT has inspired considerable research suggesting, for example, that reminders of mortality motivate people to identify with their cultural beliefs and strive to enhance their self-worth, and that defense of these structures then reduces cognitions about mortality (see e.g., Pyszczynski, Solomon, & Greenberg, 2015, and Hayes, Schimel, Arndt, & Faucher, 2010 for conceptual reviews; Burke, Martens, & Faucher, 2010 and Steinman & Updegraff 2015 for meta-analytic reviews). However, despite the many different directions of terror management research, very little work has examined heroism. This is surprising given that not only was heroism a central topic for Becker (e.g., 1971), but the first empirical TMT paper included a study that assessed reactions to an ostensibly heroic individual. Specifically, in the context of examining how mortality salience (MS) affected reactions to those who support one's worldview, Rosenblatt and colleagues (1989) found participants reminded of mortality (vs. no reminder) recommended a greater monetary reward to a person who helped apprehend a criminal (and thus presumably upheld the participants' worldview). Rosenblatt et al. referred to the "worldview supporter" as a "hero" in their discussion of the study, but an explicit focus on the existential implications of reacting to heroes specifically was never developed.

Recent research has started to fill this gap by probing the relationship between mortality concerns and heroic enactment. McCabe, Carpenter, and Arndt (2015) theorized that if heroes

are culturally valued and death reminders enhance striving for cultural values, then death

reminders should enhance effort on an ostensibly heroic task. They further reasoned that

feedback about whether or not one completed the heroic task successfully should predict the

extent to which the topic of death continues to be cognitively active. Consistent with these

hypotheses, after reminders of mortality (vs. a control topic) and linking pain endurance to

heroism (vs. a positive personality), participants reported less pain during a cold pressor task.

Further, participants who had their heroism or positive personality confirmed (vs. disconfirmed)

by false feedback showed lower death thought accessibility (DTA; as assessed by a word

completion task where some words could be completed with death or non-death words, e.g.,

COFF_ _ could be COFFIN or COFFEE [see Hayes et al., 2010]). While this study suggests

perceptions of being heroic can confer existential security, questions remain concerning the role

of mortality awareness in motivating *identification* with heroes, and whether such identification

also serves an existential function.

The present research: The existential underpinnings of hero identification.

Following Rank (e.g., 1909), Becker (1971; 1973) argued that feelings of worth (self-

esteem) reflect cultural significance and foster a sense that one will transcend mortality by

gaining symbolic immortality. Heroism was considered to be the idealization of this process, in

that heroes not only at times transcend death themselves, but also embody cultural values and,

thus, achieve symbolic immortality. As an ideal, heroes could then provide others the

opportunity to vicariously experience feelings of worth and immortality by fostering a sense of

identification with said hero. Consequently, Becker argued awareness of mortality not only spurs

people to heroism, but also plays a central role in people's propensity to identify with heroes.

By identifying with heroes, Becker (1973) suggested death concerns are quelled as the

death transcending qualities of heroes are transferred to the self. Although this idea has not yet been tested, some research is consistent with aspects of this analysis. Sullivan and Venter (2005) presented participants with a Stroop-like task involving making judgments about whether certain traits were self-descriptive or not. Participants were faster to endorse traits shared with their heroes, but not their non-heroes, suggesting inclusion of heroes in the self-concept. As noted above, however, it is currently unknown whether certain motivational factors might exacerbate this kind of identification. The present work examines the possibility that awareness of mortality prompts greater identification with heroes, and thus, a greater incorporation of heroes into the self. This hypothesis is examined in Study 1.

Concerning hero identification, there are many ways such identification may be functional. For example, heroes have been argued to provide utility as leaders to guide others through difficult circumstances (Freud, 1922; Le Bon, 1895; Fromm, 1941), vicarious experiences of success (Bernhardt, Dabbs, Fielden, & Lutter, 1998), increases in positive affect and self-esteem (as with basking in reflected glory; Cialdini & Kenrick, 1976), ideal self-images that guide behavior toward attaining a possible self (Higgins, 1987; Sullivan & Ventor, 2005; Caughey, 1984), and role models (Yoon & Vargas, 2014). However, one function of hero identification yet to be explored is the protective utility of identified heroes against existential concerns. Indeed, the relationship between identification with heroes and mortality concerns may be bidirectional, such that not only may hero identification be motivated by mortality concerns, but such identification might quell the psychological threat of mortality. This second possibility is examined in Study 2, and with a more nuanced look at specific heroic traits, in Study 3.

Taken together, the present studies examine two central questions about motivations and functions related to hero identification. First, do death reminders motivate hero identification?

Second, does hero identification reduce activation of death-related thoughts?

Study 1

To inform whether mortality reminders motivate hero identification, Study 1 examines self-representations. People's self-representations are multifaceted, and can include other people (Aron, Aron, & Smollan, 1992). Inclusion of others into the self has been argued to be a core facet of social identification (Coats, Smith, Claypool, & Banner, 2000; Schubert & Otten, 2002; Tropp & Wright, 2001), and includes such aspects as feelings of shared meaning (Scutz, 1970) and of being in communion (Bakan, 1966, Merleau-Ponty, 1945). Further, as noted, previous research suggests heroes are included in the self (Sullivan & Venter, 2005). What are the motivational catalysts of this identification? Study 1 tested whether mortality reminders are one such trigger that spurs people to include their heroes in the self.

In addition, Study 1 sought to inform two other issues. The first concerns the role of the self in existentially motivated hero identification. To the extent a person's heroes form part of the self-identity network (e.g., Sullivan & Ventor, 2005), self-salience should temporarily provoke activation not just of the self, but also of one's heroes, and the link between those constructs. In contrast, a focus on others might disrupt this link. Integrating this work with TMT gives rise to a novel hypothesis. If hero identification is motivated in part by awareness of mortality, the capacity of MS to motivate inclusion of the hero in the self may be moderated by the salience of the self. However, a manipulation of the salience of self is not typical of terror management studies on identification, and thus it is not clear whether experimentally induced self-salience is necessary. Study 1 included such a manipulation to examine this possibility.

Additionally, Study 1 examined the effects of conscious vs. non conscious mortality concerns and implications for hero identification. Research finds conscious thoughts of death

tend to motivate people to make rationally-oriented efforts to remove death-related thought from

focal awareness (e.g., through suppression, distraction, or vulnerability reduction; Greenberg et

al., 1994; Goldenberg & Arndt, 2008). In comparison, death thoughts outside of focal awareness

motivate people to rely on cultural values that provide a sense of existential security (e.g.,

Greenberg et al., 2000; Pyszczynski et al., 1999). Consequently, following prior research, the

presence of a distraction task following the MS induction was manipulated to test if conscious

thoughts of mortality have differential effects on hero identification (inclusion in the self),

relative to non-conscious thoughts of death. Conceptually, this tests the idea that if heroes are

culturally valued and thoughts of death outside of focal attention spur cultural identification

processes, then heroes should be more strongly included in the self when death thoughts are

outside of focal attention (i.e., when cultural buffers are engaged).

Method

Participants.

One hundred sixty MTurk workers (age: *M*= 32.14, *SD*= 10.18; male = 100, female = 60)

participated for financial compensation ($1.88). Participants were randomly assigned to

conditions in a 2 (Salience: MS vs. uncertainty) X2 (no distraction vs. distraction) X2 (self vs.

other prime) experimental design. Across studies, sample sizes were based on recommendations

at the time the studies were run (Simmons, Nelson, & Simonsohn, 2011), and reflect conventions

in the terror management literature supported by meta-analyses on MS effect sizes when longer

delay tasks are included between the MS manipulation and assessment of the dependent variable

(e.g., Martens, Burke, Schimel, & Faucher, 2011; Steinman & Updegraff, 2015). We return to

this issue in the general discussion.

Materials and Procedure.

MS. To manipulate awareness of mortality, a method extensively employed in TMT

studies was used (Burke et al., 2010). In the MS condition, participants completed two open-

ended questions, "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 happens to you as you physically

die and once you are physically dead." The control condition asked similar questions about

another potential existential threat – uncertainty ("Briefly describe the emotions that thought of

being uncertain arouses in you" and "Jot down, as specifically as you can, what you think

happens to you physically when you experience uncertainty"). This comparison condition helps

to inform whether heroic identification is spurred by reminders of mortality relative to other

existential concerns.

Distraction. To manipulate the level of consciousness of existential thoughts, participants

were next either given or not given a set of distracter tasks. The distraction tasks, as used in

previous studies, were included to move thoughts of mortality out of direct conscious attention

(see Martens, Burke, Schimel, & Faucher, 2011; Steinman & Updegraff, 2015, for relevant meta-

analyses). Those in the distraction condition completed the 20-item Positive and Negative Affect

Schedule (PANAS; Watson, Clark, & Tellegen, 1988; note this also allowed for an assessment of

initial effects on affect) and read an extract from a short story (Camus, 1958), taking

approximately 5 to 8 minutes to complete. The no-distraction condition did not include these

tasks.

Self/Other prime. Following these manipulations, to prime thoughts about the self or

other people, participants completed a modified version of the linguistic implications form

(Wegner & Giuliano, 1983); this 10- item measure involved completing sentences by selecting

either self-focused pronouns, or other-focused pronouns. Example items include "Please don't do

this to (me, my, I), it is just not fair" (self condition), and "After spreading fertilizer liberally

over the flower bed, (he, she, they) watered the flowers" (other condition).

Inclusion of the hero in the self. Participants then completed a modified version of the

inclusion of other in self scale (IOS; Aron et al., 1992). The scale is designed to examine how

much "the other is included in the self", and has been used in prior identification studies (e.g.,

Tropp & Wright, 2001). Participants were instructed to think about a hero and their relationship

with that hero, and then instructed to select one of seven Venn diagrams which overlapped to

various degrees, from completely separate to near complete overlap. One circle contained the

word "Self" and the other contained the word "Hero". The more overlap, the more the hero is

considered to be included in the self.

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

Inclusion of the hero in the self. A 2 (MS vs. uncertainty) X2 (no distraction vs.

distraction) X2 (self vs. other prime) ANOVA on IOS revealed a main effect of MS, $F(1, 152) =$

13.5, $p<.001$, $\eta_p^2 =.08$, such that after reminders of mortality, inclusion of the hero in the self

was greater. There was also a main effect of distraction, $F(1, 152) = 6.65$, $p =.011$, $\eta_p^2 =.04$, such

that, after a distraction inclusion of the hero in the self was greater. As depicted in Figure 1 and

Table 1, the predicted 3-way interaction between MS, distraction, and self-prime also emerged,

$F(1, 152) = 6.42$, $p = .012$, $\eta_p^2 =.04$[1].

A series of planned comparisons revealed a pattern consistent with hypotheses. When

participants were reminded and then distracted from mortality and primed with the self, they

showed greater inclusion of the hero in the self than participants who were reminded of but not

distracted from mortality and primed with self, $t(39)= 3.55$, $p <.001$, $d = 1.14$, participants who

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[1] Because of unequal sample sizes, weighted means analyses were pursued, this did not significantly alter the patterns of results reported.

were reminded of mortality, distracted, but not primed with self, $t(43)= 1.98$, $p=.049$ $d = .6$, and

participants who were distracted and primed with the self but reminded of uncertainty, $t(36)=$

4.31, $p < .001$, $d = 1.44$. In short, they evinced more hero inclusion than all other conditions.

Affect. A MS vs. uncertainty ANOVA on those who received the PANAS revealed no

effects of MS on positive affect ($\alpha^2 = .89$; $F[1,78]=.19$, $p=.667$), or negative affect ($\alpha = .88$; $F[1,$

$78]=1.181$, $p=.182$). There was, however, an effect on fear affect ($\alpha = .86$; $F[1, 78]=6.32$,

$p=.014$)[3].

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

Study 1 tentatively suggests mortality reminders may motivate hero identification. When

participants were reminded of, and then distracted from, thoughts of death, and the self was

primed, participants evinced greater inclusion of the hero in the self.

In addition to the main finding that a reminder of mortality seemed to spur hero

identification, Study 1 also makes three further tentative contributions concerning the role of

mortality concerns in hero identification. First, greater inclusion of the hero in the self was only

observed after MS when death thoughts were presumably outside of focal awareness, when

previous research suggests cultural defenses are engaged (e.g., Greenberg et al., 2000). There

were no differences in inclusion of the hero in the self when death thoughts were presumably in

focal attention, when rationally oriented defenses have been found to be operative. This attests to

the cultural value of heroes and suggests identification with heroes may be ineffective in dealing

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[2] All α refer to Cronbach's alpha

[3] The effect of MS on fear reflects that after MS (vs. uncertainty) fear was greater. Notably, the IOS effect held controlling for fear. Extant research suggests that while MS manipulations such as that used here do not generally increase negative affect (Burke et al., 2010), it can produce effects on affect (both positive and negative) that are typically relatively small (Arndt, Allen, & Greenberg, 2001; Burke et al., 2010). Further, recent research suggests that the affective consequences of MS may indeed lie more with fear than generalized negative affect, though these small increases in fear do not mediate effects on outcomes related to worldview defense (Lambert et al., 2014), and have not been found in a number of other studies. Because this MS effect on fear did not replicate in Studies 2 and 3, we do not discuss it further.

with conscious death thoughts. Second, the results suggest observed inclusion effects are not due

to existential threats broadly (as the control condition was also an existential threat i.e.,

uncertainty). While the salience of uncertainty has important effects on social judgment and

behavior (Van den Bos, 2001), in the present context, it did not produce the same effects as

reminders of mortality. Third, the results suggest an important role of self-salience, in that

inclusion effects did not emerge when participants were not primed to think of the self.

An ambiguity of Study 1, however, stems from the omission of a non-hero comparison

target. Although the focus of the study was on determining whether MS would engage heroic-

self inclusion, and not with whether such inclusion was necessarily unique to heroes, this

omission raises questions about the terror management function of heroic identification relative

to other types of identification. One way to inform this ambiguity is to manipulate whether

participants are given the opportunity to identify with a personal hero or with someone they do

not consider a personal hero and assess the potentially differential effects on death-related

cognition. Study 2 adopts this approach.

Study 2

Study 2 shifts focus from death concerns motivating identification with heroes, to

examining how such identification may function to reduce mortality-related cognition. To test

this, participants, after being distracted from reminders of mortality (vs. control), wrote about

either a personal hero, someone else's hero, or an acquaintance. It was hypothesized that, after

reminders of death (vs. control) and bringing to mind a personal hero (with whom they

presumably identify), participants would be shielded from mortality concerns as indexed by

lower DTA. The inclusion of the other person's hero condition allowed a test of whether

bringing to mind heroes generally decreases mortality-related cognition, or if such decreases are

the result of personal (identified) heroes uniquely. Similarly, the personal acquaintance condition was included to discern whether bringing to mind anyone (hero or not), tethered to the self, might serve to placate death-thoughts, perhaps as such facilitates feelings of not being alone (Wisman & Koole, 2003).

The self-prime was not included for this study as it was reasoned that writing about a personal hero (vs. other's hero vs. personal acquaintance) was sufficient to activate thoughts of a hero tethered to the self, i.e., an identified hero. Further, the distraction task was included across conditions as Study 1 found the existential value of heroes was only evinced when death thoughts were outside of focal awareness, when the cultural value buffer was presumably engaged. Finally, Study 2 changed the control condition from uncertainty to pain to inform whether hero identification results from eliciting threatening thoughts generally.

Method

Participants

One hundred thirty six participants (age: *M*= 36.97, *SD* = 11.95; 60 males; 76 female) completed the survey posted on MTurk in exchange for financial compensation ($.50). Participants were randomly assigned to conditions in a 2 (MS vs. Pain) X3 (personal hero vs. other's hero vs. personal acquaintance) experimental design.

Materials and Procedure.

The MS manipulation and distraction materials were included as in Study 1, with the exception that the control condition was changed from uncertainty to pain ("Briefly describe the emotions that the thought of pain arouses in you" and "Jot down, as specifically as you can, what you think happens to you physically when you experience pain").

Hero writing task. Following MS and the distraction task, participants were presented

with an ostensible 'writing task'. The accompanying instructions read "We want you to think of someone you consider a hero (an actual person)/someone who others consider a hero but you do not/someone you consider an acquaintance. In the space below please write at least a paragraph about this person such as what they look like and some of the things they have done". Participants then responded to a manipulation check question "When you think about this person, how heroic do you consider them?" on a 10-point Likert type scale (1- *Not at all heroic, 10 – Very heroic)*.

   Death thought accessibility (DTA). DTA was assessed after the writing task with a word fragment completion task used in many previous TMT studies (Hayes et al., 2010). Participants completed 25 word fragments, 7 of which could be completed with either a death-related word or a non-death word (e.g., the fragment CO_ _ _ _ could be completed as COFFIN [a death-related word] or as COFFEE [a non-death word]). Demographic information was then assessed.

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

   Manipulation check. A one-way ANOVA was conducted to examine whether the writing task successfully led participants to think of various levels of heroism. A significant effect emerged, $F(2, 133) = 35.04$, p $<.001$, $\eta_p^2 =.35$, such that the personal hero was rated as more heroic ($M= 8.89$, $SD = 1.27$) than other's heroes ($M= 4.76$, $SD =2.96$), $t(89) = 8.26$, $p <.001$, $d = 1.75$, and acquaintances ($M= 6.24$, $SD = 2.62$), $t(89) = 5.28$, $p <.001$, $d = 1.12$. The other hero was also rated as less heroic than the acquaintance, $t(88) = -2.96$, $p = .004$, $d = -.63$. There was no main effect of MS[4], $F(1, 134) = .02$, p $=.893$, $\eta_p^2 <.001$, and no two-way interaction, $F(2,$

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[4] It might expected that after reminders of death (vs. control), participants would perceive heroes as more heroic as a way to bolster their cultural worldview. That this was not exhibited may reflect a couple of factors. First, it may be that writing about one's hero was enough to mitigate existential threat, negating the need for further worldview bolstering. Second, because responses in the personal hero condition were near the top end of the scale, this might suggest a ceiling effect where there was simply not enough room to detect further increases in perceived heroism as a function of MS.

130) = .93, p =.393, η_p^2 =.01. The categories of people considered to be heroic are presented in

Table 2.

   Death thought accessibility (DTA). A 2 (MS vs. pain) X3 (writing task: personal hero vs.

other's hero vs. acquaintance) ANOVA was conducted. This revealed a main effect for MS, $F(1,$

130) = 21.76, $p <. 001$, η_p^2 =.14, such that after reminders of mortality, DTA was higher. There

was also a main effect for the writing task, $F(1, 130) = 7.72$, $p < .001$, η_p^2 =.11, such that

participants writing about their own hero had lower DTA relative to writing about other's heroes,

$t(89)$= -3.36, p =.001, d =-.71, or an acquaintance, $t(89)$=-3.44, $p <.001$, d =-.73. There was no

difference between the other hero and acquaintance condition, $t(88)$= -.03, p =.974, $d < -.01$. As

depicted in Figure 3 and Table 3, the predicted 2-way interaction between MS and writing task

also emerged, $F(1, 130) = 4.75$, p =.010, $\eta_p^2 = .07^5$.

   After being reminded of mortality, participants reported lower DTA when writing about a

personal hero relative to an acquaintance, $t(47)$= -4.54, $p <.001$, $d = -1.32$, and about other's

heroes, $t(44)$= -4.25, $p <.001$, $d = -1.28$. There was no difference in DTA after writing about an

acquaintance relative to other's heroes, $t(35)$= .06, p =.952, $d = .02$. Within the pain condition,

there was no difference in DTA when writing about a personal hero relative to the acquaintance,

$t(40)$= -.49, p =.622, $d = -.15$, or other's heroes, $t(43)$= -.52, p =.602, $d = -.16$, nor when writing

about an acquaintance relative to other's heroes, $t(51)$= -.02, p =.984., $d < -.01$.

   Examined differently, reminders of mortality (vs. pain) resulted in greater DTA when

participants wrote about an acquaintance, $t(43)$= 4.05, $p<.001$, d =1.24, or someone else's hero,

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[5] Because the Levene's test indicated unequal error variance ($p = .001$), likely a function of the unequal cell sizes, we also ran the pairwise comparisons using Welch's t-tests. This did not alter the patterns of significance reported. Further, because of unequal cell sizes, weighted means analyses were also pursued. This also did not significantly alter the patterns reported.

$t(43)= 3.87, p <.001, d =1.18$, but not when writing about a personal hero, $t(44)= .17, p =.864, d$

$=.05$.

Affect. A similar ANOVA revealed no effects of MS on positive affect ($\alpha = .92$; $F[1,$

$129]= 1.21, p=.274$), negative affect ($\alpha = .97$; $F[1, 129]= 1.02, p=.314$), or fear affect ($\alpha = .9$;

$F[1,129]= 1.09, p=.299$).

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

Study 2 is consistent with the hypothesis that bringing to mind a personal (identified)

hero serves as a buffer against the psychological threat of mortality. When participants were

reminded of death and then wrote about a personal hero, participants filled in fewer word

completions pertaining to death. This finding has the potential to inform the role of *identification*

with heroes as mitigation of death thoughts did not result from writing about other people's

heroes, or a personal acquaintance, but only from writing about one's personal hero.

However, one limitation of this study was the different levels of perceived heroism

elicited by the writing prompt. Recall that participants saw other people's heroes as less heroic

than their own heroes, and even less heroic than a mere acquaintance. It may be that having

participants think of a person others saw as heroic, but that they did not, led them to try and

justify this difference of opinion by indicating, on the manipulation check, their view that the

person was not actually that heroic. It may also be the other people's hero condition elicited

thoughts of someone participants considered a "false hero" whose ruse they had pierced e.g., a

politician of an opposing political party. Although the mean rating of heroism in this condition

was at the midpoint of the scale (M = 4.76) and thus suggests a moderate level of perceived

heroism rather than the piercing of a ruse, the possibility is still open that the results do not

reflect the influence of thinking about a hero with which one identifies, but rather could reflect

thinking about someone who was simply seen as more (truly) heroic. Further, participants' own heroes more frequently referred to family members, and this may contribute to the observed effect on DTA given that close relationships can serve terror management functions (Mikulincer, Florian, & Hirschberger, 2003). To clear up such ambiguities, and probe whether hero identification was a necessary ingredient for the reduction of death-cognition, a task was needed that presents people with the same hero, but allows for variation in identification with the hero. This was the focus of Study 3.

Study 3

Although Becker (1973), Sullivan and Venter (2005), and Study 1 suggest heroes can be bound up with the self, questions remain concerning whether identification is necessary for heroes to placate death thoughts. Study 2 presumed, based on prior research (Sullivan and Venter, 2005), that a personal hero was also an identified hero. Study 3 provides a more direct test of the role of hero identification and its capacity to mitigate death thoughts — that is, does the hero have to be "my hero" to reduce DTA? If so, how can a connection between the self and a hero be fostered? One way people feel connected to others is through shared personal information. Finch and Cialdini (1989) found when people ostensibly share a date of birth with a target person, they tend to evaluate that target person more positively; Study 3 borrowed this reasoning. Participants were reminded of death (or not), and exposed to a hero who shared a connection with the participant (in the form of shared date of birth), or not. DTA was then measured.

To expose all participants to the same hero, thus avoiding preexisting biases tied to people's extant heroes - a hero had to be constructed with which participants would (or would not) be led to identify. This necessitated a consideration of the core traits of heroes, with an eye

toward identifying the facets of heroes that may protect against existential threat. As such, an additional focus of Study 3 was to probe the existentially valuable traits of heroes and the role they play in the potential placating of mortality related cognition. While numerous characteristics and traits are associated with heroism (see e.g., Goethals & Allison, 2012; Kinsella, Ritchie, & Igou, 2015), Becker highlighted the heroic characteristics of *sacrifice* and *legacy,* as often motivated by mortality concerns, and their importance in heroes' quelling such concerns. Accordingly, Study 3 focuses on these two aspects of heroes in relation to death cognition.

Sacrifice, which others have considered a trait prototypical of heroes (S. Becker & Eagly, 2004; Kinsella et al., 2015), may be existentially important because it involves navigating situations that require overcoming adversity, such as those that present potential harm, a defining feature of heroism (Stenstrom & Curtis, 2012), and because it is associated with confidence in the face of death (Becker, 1973). Importantly, from a terror management perspective, one reason sacrifice may be existentially valuable is that it helps to advance the individual's legacy. Heroes often sacrifice to perpetuate a way of life, or collection of values, which proponents of that way of life or values will often then reward (e.g., soldiers who sacrifice their lives defending their country often gain a legacy through being memorialized, Durkheim, 1951; Lerner, 1991; recall also the Rosenblatt et al [1989] study, in which, the "hero" was rewarded more money for helping apprehend the criminal).

Previous TMT work informs the link between death concerns, sacrifice, and legacy. Routledge and Arndt (2008) reminded British participants of death (vs. dental pain), before asking them to imagine working either for an organization that would perpetuate after their death, or, cease to exist once they had passed away. Participants then indicated willingness to physically self-sacrifice for England. Participants reminded of death and asked to imagine the

scenario that did not provide symbolic immortality indicated greater willingness to sacrifice,

presumably because it offered a death-transcending symbolic identity (or legacy; i.e., one's

nation) that was not otherwise available. Recent work also informs the link between sacrifices in

the defense of cultural values and perceptions of heroism. Schindler and Reinhard (2015)

hypothesized Edward Snowden, a whistleblower who revealed that the US government was

spying on its citizens, would be seen more heroically after a death reminder because he made a

sacrifice (potential jail time/exile from his homeland) in order to defend a cultural value – truth.

Findings revealed participants reminded of death did indeed perceive Snowden as more heroic

than those not reminded of death. Collectively, these studies are consistent with Becker's (1973)

theorizing highlighting the integral role of sacrifice and legacy for heroism, and its potential

terror management function.

Taken together, theory and research converge to suggest sacrifice and legacy

achievement are bound up together and may be central to the existential function of heroes.

However, questions arise concerning the necessity of the interconnectivity of sacrifice and

legacy in terms of the identified hero's efficacy in reducing DTA. That is, do sacrifice and legacy

individually, or in combination, have the capacity to reduce death-related thoughts when

participants are led to identify with heroes who hold varying sets of such traits? Further, legacies

can be more or less enduring. Some last for a short period, others for centuries. Therefore, Study

3 manipulates the traits of the hero with which participants will identify (or not) to test whether

sacrifice and holding a legacy (of varying duration) is important in reducing DTA with the

assumption being that longer legacies provide greater defense against mortality concerns than

more fleeting ones.

In sum, for Study 3, we hypothesizes that, after reminders of mortality, DTA will be

lower when participants are led to identify with a hero through a shared connection to the self

(i.e., date of birth). Thus, this study will address the concern in Study 2 regarding whether

participants rated their own heroes as more heroic because they identified with them or because

they were simply (in their eyes) more heroic than someone else's hero. However, given the

ambiguity about whether the heroic traits of sacrifice and having a legacy confer existential

security separately or in tandem, we advance no firm predictions on this question. Lower DTA

may (or may not) occur when the hero is portrayed as separately sacrificing or having a legacy,

or when displaying both of these attributes together.

Method

Participants

One hundred sixty undergraduate students (age: *M*= 19.34, *SD*= 2.06; male = 70, female

= 90) were randomly assigned to conditions in a 2 (Salience: Mortality vs. failure) X4 (Heroic

traits: Legacy linked to self vs. Sacrifice linked to self vs. Legacy and sacrifice linked to self vs.

Legacy and sacrifice together not linked to self).We opted for only one (legacy and sacrifice)

control condition in which the heroic portrayal was not linked to the self (i.e., through birthdate)

because we reasoned that if these traits are existentially valuable (in the sense that they reduce

DTA), then this would be most likely when they were presented in tandem. As such, a condition

in which both legacy and sacrifice are highlighted but not linked to the participants represents the

strongest control condition. Stated differently, the identification variable was not fully crossed

with the other factors and only manipulated in the legacy and sacrifice condition. Table 4

clarifies the different features of the conditions.

Materials and Procedure.

Participants completed the MS/control manipulation similar to those in Study 1 and 2

with two changes. First, the distraction task utilized the expanded, 60-item version of the

PANAS (Watson & Clark, 1999). Second, the control topic was again changed, this time from

pain to failure, to assess the potential unique effects of the psychological threat of mortality vs.

threat generally ("Briefly describe the emotions that the thought of failure arouses in you" and

"Jot down, as specifically as you can, what you think happens to you physically when you

experience failure"). Participants were then exposed to the hero manipulation before completing

the DTA measure as in the previous study.

   Hero exposure. To expose participants to a hero with the traits of sacrifice, legacy, legacy

and sacrifice (connected to the self vs. not) participants read an ostensible excerpt from a

newspaper (generated via http://www.fodey.com/generators/newspaper). The headline read

either "Hero talks of sacrifice", "Hero talks of legacy", or "Hero talks of sacrifice and legacy".

The main body of text then described the acts of a hero (gender matched to participant) who

rescued a baby from a burning car. Additional aspects that were varied included whether the hero

was injured by flames during the rescue (sacrifice) or not and whether the rescue conferred a

longer legacy, taking place three years ago (legacy) vs. fleeting legacy, taking place a week ago

(see Table 4). For those in the legacy and sacrifice condition the hero was both injured and

executed the rescue three years ago. For the conditions in which a connection with the hero was

fostered, following Finch and Cialdini (1989), we had the hero share the participant's date of

birth (obtained from a mass pretest completed at the beginning of the semester). For those in the

no connection condition the hero's date of birth was not reported. After the article, participants

completed the DTA and demographics measures.

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

   Death thought accessibility. A 2 (MS vs. failure) X4 (Heroic traits: Legacy linked to self

vs. Sacrifice linked to self vs. Legacy and sacrifice linked to self vs. Legacy and sacrifice not

linked to self) ANOVA was conducted. This revealed a main effect for MS, $F(1, 152) = 4.31$, $p =$

.039, $\eta_p^2 = .03$, such that after reminders of mortality, DTA was higher. There was also a main

effect for heroic traits, $F(3, 152) = 3.82$, $p = .011$, $\eta_p^2 = .07$, such that participants exposed to the

hero who both sacrificed and had a legacy but who had a different birthday had greater DTA. As

depicted in Figure 3 and Table 5, the predicted 2-way interaction between salience and heroic

traits also emerged, $F(3, 152) = 3.69$, $p = .013$, $\eta_p^2 = .07^6$.

After being reminded of mortality, when a link to the hero who both sacrificed and had a

legacy was not fostered (i.e., participants did not share a birthdate), the accessibility of death-

related thought was greater relative to the failure salience condition, $t(38) = 3.27$, $p < .001$, $d =$

1.06; this demonstrates that absent fostered identification with the hero, MS did indeed increase

DTA. However, when identification with the hero was fostered via the shared birth date,

participants reminded of mortality no longer showed increased DTA. Not only did they not differ

from their control condition counterparts (all pairwise ts<1, ps>.318), but those with a link to the

hero who sacrificed, $t(38) = 3.01$, $p < .001$, $d = .97$, had a longer legacy, $t(38) = 3.72$, $p < .001$ $d =$

1.21, and both sacrifice and longer legacy, $t(38) = 3.72$, $p < .001$, $d = 1.21$, had lower DTA than

MS participants for whom a link to the hero was not fostered. Moreover, there were no

differences between MS participants who were linked to a sacrificing hero, a hero with longer

legacy, or sacrifice and legacy (all pairwise ts< 1, ps> .318), suggesting that each feature

separately or together is sufficient to mitigate thoughts of mortality.

Affect. A similar ANOVA revealed no effects of MS on positive affect ($\alpha = .88$;

$F[1,158] = 1.29$, $p = .262$), negative affect ($\alpha = .79$; $F[1, 158] = .93$, $p = .342$), or fear affect ($\alpha = .74$;

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[6] A Levene's test indicated unequal error variance ($p = .01$). However, as this study had cells with an equal number of participants, the ANOVA is robust to violations of this assumption.

$F[1, 158]=.22, p=.644).$

Discussion

Study 3 builds on the previous studies to suggest that after mortality reminders fostered hero identification functions to lower DTA. Further, the results suggest the heroic traits of sacrifice and legacy (separately, or in combination) may reduce mortality-related cognition, but importantly, this may only be possible to the extent that an individual is able to draw a connection between the self and the hero e.g., via shared date of birth. Finally, given the control topic was again shifted from pain to another threat i.e., failure, additional evidence is provided for the unique effects of death cognition.

General Discussion

The present research utilized a terror management perspective to investigate the relationship between mortality concerns and hero identification. Three studies explored two questions about motivations and functions related to hero identification. First, does awareness of mortality motivate hero identification? Second, does such identification help to manage the cognitive activation of death-related thought?

Study 1 found that when reminded of mortality, given a distraction task, and then primed with the self, participants indicated greater hero identification as demonstrated by more overlap between the self and a hero. These findings provide a tentative extension of existing research, noting heroes are integrated with the self (e.g., Sullivan & Venter, 2005), and also highlights a potential underlying motivation that can spur such inclusion. Further, the study found that hero identification was motivated specifically by non-conscious thoughts of mortality. Greater levels of inclusion of the hero in the self were not observed in response to the salience of uncertainty, or consistent with the dual process model of TMT, when participants still presumably had death-

related thoughts in focal attention (Pyszczynski et al., 1999). As noted previously, the lack of a non-hero target leaves unanswered questions about the specificity of the effect to heroes.

Study 2 switched focus to the existential function of hero identification, specifically examining whether such identification facilitates the management of the psychological threat of mortality. After reminders of mortality and writing about a personal hero, participants reported lower DTA. Study 2 distinguished that the link between a hero and the self was important in placating mortality-concerns as the reduction in DTA only occurred when writing about one's own (identified) hero and not other's heroes, or an acquaintance. Thus, Study 2 helps to address some of the ambiguity from Study 1, albeit indirectly.

Study 3 continued the focus on the existential function of hero identification, fostering hero identification (or not), to probe the necessity of identification in reducing the accessibility of death-related thoughts. Further, the study extended the investigation to probe characteristics of the hero that may contribute to this functionality. Specifically, after reminders of mortality and reading about an ostensible hero who sacrificed and/or had a legacy, participants reported lower DTA, but only when they were led to identify with the hero via a shared personal detail (date of birth). It seems that for heroes to help thwart death-cognition, the hero has to be "my hero". The study also informs Becker's (1973) and others' (e.g., see S. Becker & Eagly, 2004) theorizing that legacy and sacrifice are existentially valuable traits of heroes, as participants displayed lower DTA when they could draw a link between themselves and a hero who had these traits, either separately or in tandem.

Taken together these studies offer advances on four fronts for terror management and heroism research. First, Study 1 is the first to illustrate the motivational properties of death-cognition for hero identification. Second, Studies 2 and 3 highlight a hitherto unrecognized

function of hero identification i.e., defense against mortality concerns. Third, Study 3 suggests

characteristics of identified heroes that may be influential in their capacity to offer existential

solace i.e., legacy and sacrifice. Fourth, these studies contribute to extant terror management

literature demonstrating various routes to existential security via social identification. For

example, research indicates MS increases women's perceived similarity to other women (Arndt

et al., 2002), greater optimism for Dutch participants' national soccer team to succeed (Dechesne

et al., 2000), and that Americans' worldview defense was mediated by identification with

America (Hohman and Hog, 2014). The present research builds on these studies, uncovering a

previously unrecognized identification pathway to quell death concerns - identification with our

heroes.

Despite the conceptual contributions and insights offered by the present studies, they also

raise issues that may merit future research. One concern with the present studies may relate to

statistical power and sample size. Although, as noted, these studies followed conventions at the

time they were conducted, in recent years there has been considerable discussion about the

merits of large samples and issues of power. To justify the current sample sizes one could point

to meta-analyses of MS effects which implicate a medium to large effect size, especially when

longer delays are included in the experimental procedure as was done here (Burke et al., 2010;

Martens et al., 2011; Steinman & Updegraff, 2015), or one could appeal to effect sizes from

previous research that has investigated, of present relevance, monetary rewards to heroes after

MS (Rosenblatt et al., 1989) or different types of cultural identifications (e.g., Arndt et al., 2002).

Power analyses (G*Power; Faul, Erdfelder, Buchner, & Lang, 2009) with such estimates

(assuming $r = .42$ $(d = .93)$, suggested approximately 20 participants per cell to detect effects of

similar magnitude. However, we do not find these justifications compelling, as such effect sizes

(and thus inferences about power and sample size) are as much if not more about the sensitivity of the particular laboratory measures and manipulations as they are about the strength of the underlying psychological process. More importantly, such effect sizes are ultimately of limited utility insofar as the present studies explored effects related to a novel psychological process (i.e., heroic identification) with novel manipulations and or measures and previous effect sizes are of questionable relevance. The field clearly has differing and passionate views on this broader issue, and thus from some contemporary perspectives, the present studies may be seen as underpowered and the present effects critiqued as unreliable. At this point, it may be most prudent to regard the present findings as existing within a tentative context of discovery and awaiting further research to establish robustness and reliability (Baumeister, in press; Sakaluk, in press).

Secondly, although hero identification was measured in Study 1, there was no comparable measure to determine if MS leads to identification (inclusion of other in the self) with anyone (vs. heroes specifically). Though we did not make the prediction that MS leads to hero identification uniquely (which would ignore previous research TMT on identification noted above), future research might examine whether MS results in greater or similar levels of identification with heroes vs. worldview-supporting non-heroes. As Becker noted (1973), heroes are central to, and often embody worldview values. As such, heroes may be identified with to a greater degree after MS as they may wield greater 'cultural power' compared to non-heroic cultural worldview supporters. Indeed, irrespective of whether MS can motivate a general tendency to identify with others or not, when considered alongside extant literature such as Sullivan and Ventor (2005), finding quicker response rates on an IOS self-description test for hero (vs. non-hero others) traits, McCabe et al (2015) finding lower reported pain in the hero (vs.

positive personality) condition, and Kut et al (2007) finding that hero identification via role-

playing a hero (vs. control) led to greater pain tolerance, it is plausible to suggest that hero

identification (vs. identification broadly) has some distinct psychological properties.

In relation to the above point, intriguing questions also remain concerning the

nomological network of mortality cognition, hero identification, cultural worldview defense, and

self-esteem. Becker (1973) suggested that cultural significance provides feelings of self-worth,

which protects an individual from overwhelming fear of death, and that heroism was the

idealization of this process. Though the present research had people bring to mind their own

hero, and fostered identification with a hero, consideration about how hero identification relates

to cultural worldview defenses and implications for self-esteem remain to be studied. Locating

the present research within the broader landscape of TMT literature may suggest one hypothesis.

Consider previous TMT studies finding mortality reminders exacerbate religiosity for those

partisan to different religions (Vail et al., 2010), enhance risky driving for those who gain self-

esteem from being a fast driver (Taubman Ben-Ari, Florian, & Mikulincer, 1999), and result in

greater political affiliation (Greenberg & Kosloff, 2008). Future research might examine whether

figures central to these value systems e.g., Jesus, Michael Schumacher, and political party

leaders, are seen as more heroic, and are more closely integrated with the self, perhaps enhancing

self-esteem, after mortality reminders.

Finally, it is unclear how terror management processes are implicated, if at all, in the

bridge between hero identification and heroic enactment. While the present studies suggest

mortality reminders can result in greater inclusion of the hero in the self, and prior research

(McCabe et al., 2015) found death reminders can spur heroic enactment, little is known about

whether existential concerns play a role in the potential shift from hero identification to heroic

enactment. However, previous research, from beyond the purview of TMT, indicates there may be a link. Yoon and Vargas (2014) found participants who first played as, and presumably identified with, a hero (vs. villain) in a videogame, in a later ostensibly unrelated study, allocated less unpleasant hot chili sauce and more chocolate to an apparent future participant. Though one might reasonably contest that offering chocolate to an unknown person does not constitute the most heroic gesture, this research does suggest hero identification may translate to enactments consistent with the identified hero. Juxtaposing this research with the current studies opens the intriguing possibility that mortality cognition may serve as the lubricant to accelerate the transition from identification to enactment. Indeed, as alluded to in Don Quixote's transition from merely consuming heroic tales to actually becoming the infamous hero knight-errant, it may be that hero identification precedes heroic enactment, and that terror management efforts can be an important part of this process.

Conclusion

Using Becker's (1973) theorizing and the terror management framework (Greenberg et al., 1986), three studies informed the bi-directional relationship between mortality concerns and hero identification. Two questions guided the exploration: Does awareness of mortality motivate hero identification? And, does such identification placate mortality concerns? Taken together, theoretical advances were made in how researchers might understand hero identification from an existential perspective, identifying a potential motivational catalyst underlying hero identification (awareness of death), highlighting important existential attributes of heroism (sacrifice and legacy) and how these attributes may aid in reducing thoughts of death. These studies thus help inform the motivational underpinning and function of hero identification.

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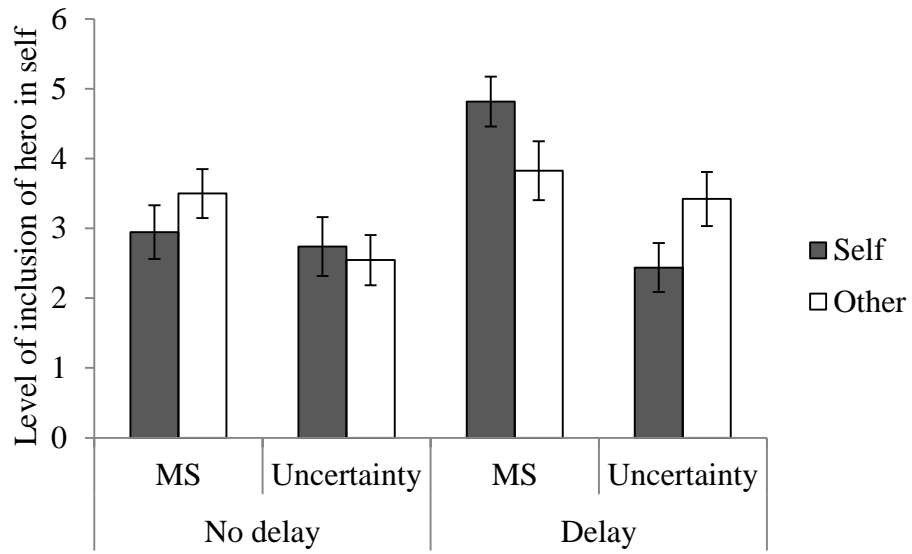representation on behavior. *Psychological Science*, *25*, 1043-1045.

Figure 1. Three-way interaction between MS, distraction, and self/other prime (Study 1).
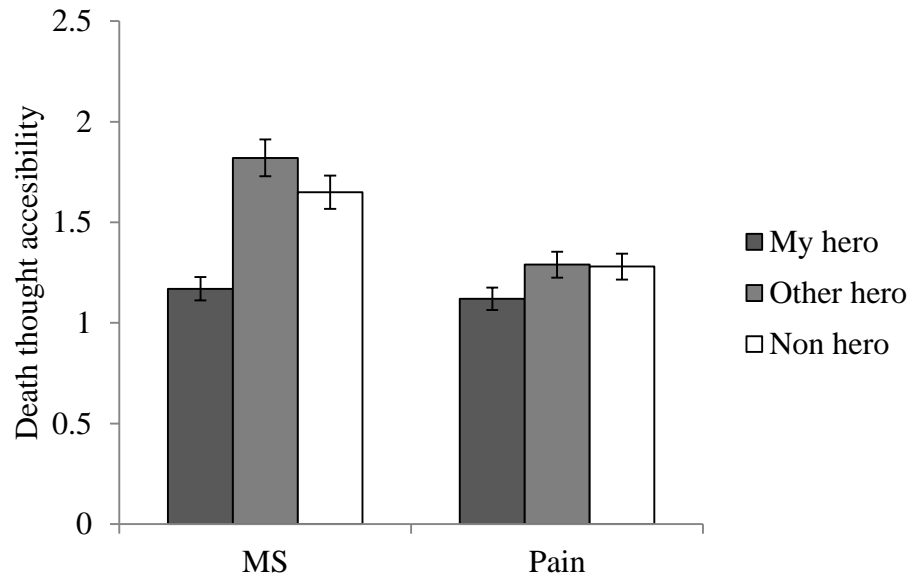
Error bars represent +/- 1 standard error.

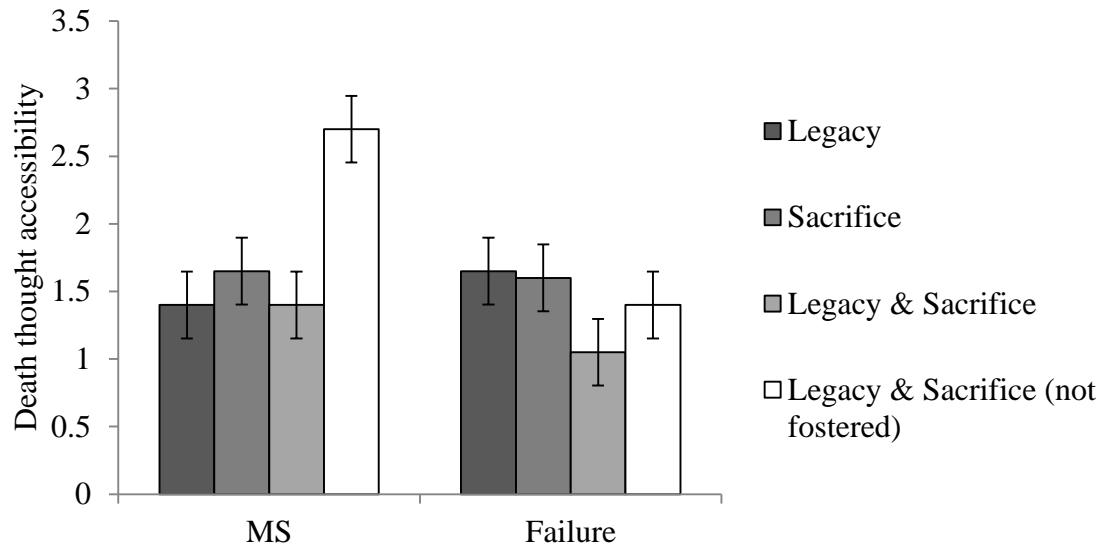Figure 2. Two-way interaction between MS and writing task (Study 2). Error bars represent +/- 1 standard error.

Figure 3.Two-way interaction between MS and hero traits condition on DTA (Study 3).

Error bars represent +/- 1 standard error.

Table 1. Inclusion of hero in self scores by experimental condition (Study 1)

| | No Distraction | | | | Distraction | | | | |
| | Self | | Other | | Self | | Other | | |
	MS	Uncertainty	MS	Uncertainty	MS	Uncertainty	MS	Uncertainty	Overall
Condition N	19	23	16	22	22	16	23	19	160
	M(SD)	M(SD)	M(SD)	M(SD)	M(SD)	M(SD)	M(SD)	M(SD)	M(SD)
Inclusion of hero in self	2.95 (1.65)	2.74 (1.82)	3.50 (1.79)	2.55 (1.34)	4.82 (1.92)	2.44 (1.46)	3.83 (1.75)	3.42 (1.61)	3.31 (1.81)

Table 2. Categories and percentage breakdown of who participants wrote about when considering their own and others heroes (writing task Study 2)[7]

	Own hero N= 46	Others' hero N= 45	Total N= 91
Business leader	0.0%	2.2%	1.09%
Celebrity	4.3%	8.9%	6.59%
Emergency services	2.2%	4.4%	3.29%
Family	45.7%	8.9%	27.47%
Friend	4.3%	0.0%	2.19%
Military person	2.2%	2.2%	2.19%
Politician	15.2%	37.8%	26.37%
Religious figure	8.7%	2.2%	5.49%
Sports person	2.2%	6.7%	4.39%
Teacher	0.0%	6.7%	3.29%
Whistleblower	2.2%	2.2%	2.19%
Specific person/ categorizing information not given	13%	17.8%	15.38%

[7] Categories were arrived at by two RAs who judged each entry individually before codings were compared and discussed. Three codings that still differed after discussion were resolved by the first author.

Table 3. Death thought accessibility scores by experimental condition (Study 2)

| | Own hero | | Others' hero | | Non-hero (acquaintance) | | Overall |
	MS	Pain	MS	Pain	MS	Pain	
Condition N	29	17	17	28	29	25	136
	M(SD)	*M(SD)*	*M(SD)*	*M(SD)*	*M(SD)*	*M(SD)*	*M(SD)*
DTA	1.17 (1.04)	1.12 (.86)	2.53 (1.42)	1.29 (.71)	2.55 (1.43)	1.28 (2.55)	1.58 (1.18)

Table 4: Heroic traits condition features

Condition	sacrifice (injury)	legacy (3 years ago)	Link to self (birthdate)
1 (legacy)	absent	present	present
2 (sacrifice)	present	absent	present
3 (legacy & sacrifice)	present	present	present
4 (legacy & sacrifice not linked)	present	present	absent

Table 5. Death thoughts accessibility scores by experimental condition (Study 3)

	MS				Failure				Overall
	Legacy	Sacrifice	Legacy and sacrifice	Legacy and sacrifice (not fostered)	Legacy	Sacrifice	Legacy and sacrifice	Legacy and sacrifice (not fostered)	
Condition N	20	20	20	20	20	20	20	20	160
	M(SD)	M(SD)	M(SD)	M(SD)	M(SD)	M(SD)	M(SD)	M(SD)	M(SD)
DTA	1.40 (.88)	1.65 (.93)	1.40 (.94)	2.70 (1.81)	1.65 (1.18)	1.60 (.88)	1.05 (.94)	1.40 (.94)	1.61 (1.17)