

Older Adults and the Fear of Death: The Protective Function of Generativity*

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RÉSUMÉ

La théorie de la gestion de terreur (TGT) indique que les visions du monde culturel apaisent les inquiétudes au sujet de la mortalité humaine. Des recherches préliminaires avec des personnes âgées ont indiqué que les personnes âgées ne répondent pas aux rappels de la mort de la même manière que leurs plus jeunes homologues. Le but de l'étude était de tester un concept de développement pertinent qui peut fonctionner comme un tampon contre l'anxiété ressentie à la mort à la fin de vie. L'hypothèse est que le concept de générativité d'Erikson peut comprendre des propriétés niant de la mort pour les personnes âgées. Cent soixante-dix-neuf personnes âgées ont été recrutés pour déterminer si les initiations* subtiles mais saillantes de la mortalité conduirait les participants à évaluer leur propre générativité comme étant plus élevée qu'après les initiations flagrantes, ou pas du tout, après contrôle de la générativité avant l'initiation. Comme prévu, les participants exposés à subtile renforcements de la mort se sont considérés comme ayant des niveaux plus élevés de la générativité que les deux autres groupes après générativité covariable avant. Les explications sont discutées à la lumière de la littérature sur la TGT et la générativité.

ABSTRACT

Terror management theory (TMT) posits that cultural worldviews function to allay concerns about human mortality. Preliminary research with older adults has indicated that seniors do not respond to death reminders in the same way as their younger counterparts. The purpose of the current study was to test a developmentally relevant construct that may buffer death anxiety in later life. It was hypothesized that Erikson's concept of generativity may encompass death-denying properties for older adults. One hundred and seventy-nine seniors were recruited to determine if subtle mortality salience inductions would lead participants to rate their own generativity as higher than after a blatant induction, or no induction, after controlling for pre-induction generativity. As expected, participants exposed to subtle death primes rated themselves as having higher levels of generativity than the other two groups after co-varying pre-induction generativity. Explanations are discussed in light of the literatures on TMT and generativity.

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The idea that human beings are the only animals who have an awareness of their impending death has long fascinated scholars. In his book *The Denial of Death*, cultural anthropologist Ernest Becker (1973) argued that this awareness must be denied by human beings in order for them to function effectively. In this article, we describe a small number of ways in which people around the world have been reliably shown to defend themselves against the anxiety aroused by the awareness of death. These ordinary defenses do not appear to work in the same way with seniors. We then describe an experiment designed to test a process specific to older adults that is anticipated to contribute to the alleviation of their anxiety regarding their own death.

The first empirical study of death attitudes (Feifel, 1956) used an older adult sample. From that one study in the 1950s, more than a thousand articles were written on death anxiety by the early 1990s (Neimeyer & Van Brunt, 1995). Advances in assessment tools, research journals, professional organizations, and global threats to survival (e.g., AIDS, terrorism, weapons of mass destruction) all appear to have contributed to the rapid growth of the study of the human response to death (Neimeyer, Wittkowski, & Moser, 2004). Feifel's (1956) seminal research found that older adults experience less death anxiety than younger individuals, a finding substantiated in subsequent studies (e.g., Bengtson, Cuellar, & Ragan, 1977; Fortner & Neimeyer, 1999; Gesser, Wong, & Reker, 1987–1988; Kalish & Johnson, 1972; Kalish & Reynolds, 1977; Rasmussen & Brems, 1996). The idea that older adults are less afraid of death than their younger counterparts despite their temporal propinquity to non-existence continues to fascinate and perplex researchers. This fascination is further heightened in light of the findings that older adults think about their own death more than younger individuals do (e.g., Kalish & Reynolds, 1977).

Researchers continue to explore possible reasons why death anxiety appears less in older adults, and there is no one simple answer. The causes are multifactorial with both social and psychological explanations contributing to our understanding. Straightforward explanations such as acceptance of death in later life as the result of living a full life, repeated exposure to the death of others, and acceptance of societal norms valuing youth (Kalish, 1985) all appear to play a role. Furthermore, psychological changes in later life may allow more adaptive, age-appropriate strategies to be used to maintain psychological equilibrium (Erikson, 1998; Maxfield et al., 2007). For example, Diehl, Coyle, and Labouvie-Vief (1996) found that older adults were better able to use coping and defence strategies in stressful situations than younger adults. Using a measure called the Stanford Time Perspective Inventory-Revised, Lennings (2000) found that the time perspective of

greatest importance to seniors was the present, compared to the future for younger adults. For seniors, the temporal variables of past, present, and future have become less associated with optimism and life satisfaction.

Brandtstädter and Greve (1994) argued that seniors undergo adaptive compensatory activities in order to prevent losses in domains considered to be important to their self-concept. Heckhausen (1997) discovered that previous goals associated with developmental loss are replaced with more satisfying age-appropriate goals in later life. Gross, Carstensen, Pasupathi, and Tsai (1997) found that seniors report less negative emotional experiences than younger individuals. Heckhausen and Krueger (1993) reported older adults have higher levels of optimism and developmental expectations than those who are younger. Tornstam's (2005) notion of gerotranscendence suggests that seniors become less self-occupied and more attuned to past generations, universality, and cosmic connectedness. Thus, a range of studies shows older adults having achieved an impressive quality of poise and equanimity in relation to their goals and motivations, their emotional composure, their degree of sustained optimism, and their ability to move beyond themselves in the achievement of a larger purpose.

Terror Management Theory

Terror management theory (TMT; Greenberg, Pyszczynski, & Solomon, 1986) offers a comprehensive framework through which to explore this counter-intuitive phenomenon of less fear of death in older adults. TMT was born out of the writings of Becker (1973). At the heart of TMT lies Becker's existential contention that, unlike other animals, humans developed sophisticated intellectual abilities that made them aware of their inevitable death (Solomon, Greenberg, & Pyszczynski, 2004). An awareness of death is highly problematic because it conflicts with a basic drive towards self-preservation that humans share with most, if not all, other living organisms. The knowledge of inescapable death juxtaposed with a powerful drive for continued life creates a unique source of existential terror that other animals do not possess. According to TMT, this existential fear would interfere with many effective forms of thought and behaviour if experienced unabated. Humans, therefore, had to develop a defensive psychological system geared to keeping thoughts and concerns about death away from consciousness so as to limit the potential for debilitating death anxiety.

The primary way humans manage the fear of death is through cultural worldviews and self-esteem. Cultural worldviews are humanly constructed, shared-symbolic conceptions of reality that infuse human existence with a sense of meaning, order, and permanence. Self-esteem is

the general sense that one is valued within the context of the cultural worldview. Ultimately, maintaining faith in a cultural worldview and self-esteem function to alleviate the fear of death by providing individuals with a sense of death-transcendence, or immortality, which can be literal or symbolic. Literal immortality refers to the belief in some form of an afterlife for those who are faithful to their religious values. Symbolic immortality refers to symbolic extensions of the self (e.g., the family lineage, works of art, publications) that persist within the culture after one's physical death.

Over the past few decades, these intriguing ideas have led to extensive empirical research based on four fundamental hypotheses (Solomon et al., 2004). First, TMT theorists proposed the *self-esteem as an anxiety buffer hypothesis*. If self-esteem is effective in buffering an individual's death anxiety, high self-esteem should decrease the anxiety that occurs as a response to a threat (Solomon et al., 2004). This hypothesis has gained support in studies showing that participants with dispositionally high self-esteem (or self-esteem that is experimentally manipulated to be high) exhibit less anxiety in response to threats (e.g., Greenberg et al., 1992; Greenberg et al., 1993). For example, Greenberg et al. (1992) found that raising participants' self-esteem via fabricated personality feedback resulted in less self-reported anxiety in response to a graphic video on death compared to participants whose self-esteem was not manipulated. In a follow-up study, Greenberg et al. found that these results generalized to physiological indices of anxiety as well. Specifically, participants who had experimentally increased self-esteem were unaffected in terms of their physiological arousal (as assessed by skin conductance) in response to the anticipation of receiving a painful electric shock. In contrast, participants in a neutral self-esteem group demonstrated clear increases in physiological arousal.

The second hypothesis is the *mortality salience hypothesis*. If self-esteem and cultural worldview beliefs function to reduce anxiety associated with death awareness, then having individuals think about their own death or *mortality salience* should lead them to cling even more tightly to those anxiety-reducing beliefs while rejecting dissimilar beliefs (Solomon et al., 2004). This line of research initially focused on how death anxiety impacts individuals interpersonally through agreement with, and fondness for, those who uphold one's beliefs and dislike for those who challenge those beliefs (e.g., Greenberg et al., 1990; Mikulincer & Florian, 1997; Rosenblatt, Greenberg, Solomon, Pyszczynski, & Lyon, 1989). Along with attitudinal effects resulting from death reminders, behavioural effects have also been observed (Solomon et al., 2004). For example, after a mortality salience (vs. control) induction, American participants took longer on a problem-solving task that required

them to use an American flag to sift sand out of black dye (ruining the flag) and bang a nail into a wall with a crucifix (damaging the cross). Thus, when mortality is salient, Americans were especially reluctant to desecrate cherished symbols of their cultural worldview (Greenberg, Porteus, Simon, Pyszczynski, & Solomon, 1995). More than 400 published studies in over 11 different countries to date have found that mortality salience motivates attitudes and behaviours aimed at maintaining faith in the cultural worldview and self-esteem (for reviews, see Burke, Martens, & Faucher, 2010; Pyszczynski, Greenberg, Solomon, Arndt, & Schimel, 2004).

A third hypothesis is termed the *death-thought accessibility hypothesis*. If cultural worldviews and self-esteem function to reduce thoughts and concerns about death, then weakening these protective structures should increase the accessibility of death-thoughts. Supporting this hypothesis are a number of studies showing that when people encounter sufficient information to threaten a core component of their worldview or bases for self-esteem, thoughts about death (but not other aversive thoughts) become more accessible to consciousness (see Hayes, Schimel, Arndt, & Faucher, 2010). What is interesting about these studies is that death-thoughts become more accessible even though information threatening to the worldview and self-esteem makes no explicit mention of death or death-related concepts.

A fourth hypothesis follows from TMT's dual process model and has to do with the way people defend against death thoughts when they are conscious versus just outside of consciousness (Pyszczynski, Greenberg, & Solomon, 1999). When people are consciously confronted with thoughts of death, they engage in proximal defenses aimed at removing death thoughts from awareness. These defenses tend to require more cognitive effort and include tactics such as suppression, distraction, or rational attempts to deal with the problem of death by placing it in the distant future. When thoughts of death are highly accessible but not in current focal awareness, distal defenses are activated, which function to push death thoughts farther into the unconscious. Distal defenses are the broad class of symbolic defenses aimed at affirming one's cultural worldview and bases for self-esteem. Research supporting the dual process model indeed shows that immediately after mortality salience people deny their vulnerability to death, emphasize health or fitness intentions, and have low death-thought-accessibility. However, after a brief delay period, mortality reminders elevate death-thought accessibility and also lead to distal defenses such as worldview affirmation and self-esteem striving (Greenberg, Pyszczynski, Solomon, Simon, & Breus, 1994; for reviews see Pyszczynski et al., 1999, and Hayes et al., 2010).

Terror Management Theory and Older Adults

The majority of participants in TMT studies are young adults (Maxfield et al., 2007). Although the small number of studies with older adults have been somewhat inconsistent, in general seniors respond differently to death awareness than do younger adults. Taubman-Ben-Ari and Findler (2005) were interested in how death-denying psychological mechanisms influence health-seeking behaviours across the lifespan. Younger, middle-aged, and older adults responded to a self-report scale measuring health-promoting behaviours after a mortality salience or control induction. Surprisingly, older adults in the mortality salience condition were less inclined to engage in health promoting behaviours than older adults in the control condition. In contrast, the young and middle-aged adults who were reminded of their death reported a higher desire to promote health behaviours compared to their respective control conditions. The researchers concluded that older adults were likely to be more comfortable with thoughts of death than younger adults and may not have felt as much of a need to improve their health.

TMT states that individuals respond to reminders of death by asserting judgments that align with their worldview (see Rosenblatt et al., 1989). Maxfield et al. (2007) examined seniors' responses to moral transgressions. As expected, when younger adults were reminded of death, they displayed harsher judgments of hypothetical transgressors. These harsher judgments resulting from mortality salience were *not* observed with the older adults. In a second study, young adults responded to both blatant and subtle death reminders with harsher judgments whereas older adults displayed more lenient judgments compared to controls, but only when the mortality salience was subtle, not when it was blatant. In trying to explain the more lenient judgments by older adults, Maxfield et al. (2007) suggested that older adults may be more attuned to positive (vs. negative) affect (e.g., Mroczek & Kolarz, 1998) than younger adults. Another possibility raised by Maxfield et al. (2007) is that older adults are more capable of making complex attributions that include situational factors (e.g., Blanchard-Fields, 1994), and thus are better able to consider *mitigating circumstances*. With regard to the efficacy of the subtle manipulation in comparison to the blatant one, Maxfield et al. (2007) suggested that perhaps older adults have found ways to minimize the impact of death thoughts consciously but are still influenced by these thoughts when they exist on the periphery of awareness.

In a more recent study, Maxfield, Pyszczynski, Greenberg, Pepin, and Davis (2012) sought to further clarify older adults' more tolerant responses to moral transgressors. Elderly individuals with higher executive

functioning skills responded to mortality salience manipulations with increased tolerance for moral transgressors than an elderly high executive functioning control group. Furthermore, those with lower levels of executive functioning responded to mortality reminders more punitively than their respective control groups. As expected, younger adults who were given reminders of mortality were more punitive towards moral transgressors compared to a control condition. Executive functioning did not impact their responses.

Maxfield et al. (2014) recently examined older and younger adults' generativity levels subsequent to subtle death primes (word search puzzles containing death words) or a control prime (word search puzzles containing no death words). While no age differences in generativity were found between older and younger control group participants, in the mortality salience conditions older adults had higher levels of generative concern (measured by the Loyola Generativity Scale or LGS; McAdams & de St. Aubin, 1992) than younger adults. In a follow-up study, the authors were interested in older and younger adults' responses to measures they created that resulted in a pro-social (social benefit but no fame) versus pro-self (fame but no social benefit) preference score. Their hypothesis that older adults in the mortality salience condition would have higher levels of pro-social over pro-self generativity than those in the control condition was supported. Mortality salience did not impact the scores of younger adults. The authors concluded that because age differences in generativity seem to be present only when individuals are reminded of death, older adults in particular appear to use generativity as a death anxiety buffer.

Developmental Changes in Later Life

Authors of TMT studies that focus on older adults have been inspired by McCoy, Pyszczynski, Solomon, and Greenberg (2000) who brought together TMT and the gerontology literature to provide unique insights on successful aging. McCoy et al. hypothesized that two motivating factors impel seniors to reorganize psychologically: increased awareness that death is drawing near and an age-related decrease in the success of previously employed coping mechanisms. These two motivating factors are thought to lead to a reinvention of self that involves a variety of coping behaviours such as defending existing worldviews, minimizing contact with those who have a conflicting worldview, lowering standards to make them more attainable, and cognitive reframing such as being more optimistic and engaging in downward comparison. McCoy et al. also suggested that over time, older adults gain independence from social validation, perhaps resulting in a more individualized version of the cultural worldview. Finally, McCoy et al. proposed that

psychological integration via life-review and broadening social identity via *generativity* (i.e., giving back, leaving a legacy) are essential to this transformative developmental process.

Generativity and Symbolic Immortality

The developmental construct of generativity is at the core of older adults' psychological reorganization. According to Erikson (1963), generativity is a drive that motivates adults to use their own experiences to guide the next generation. Generativity's importance is in its role in *cultural reproduction* or perpetuating culture and maintaining social structures (Wakefield, 1998). Elaborating on Erikson's ideas, Kotre (1984) emphasized several kinds of generativity including biological, parental, technical, and cultural. The cultural form is highly symbolic, emphasizing bearing, nurturing, and teaching offspring. Cultural generativity moves individuals into a mentor role with the goal being to provide the young with a compelling vision of their potential as well as their culture's potential.

Death awareness is an integral part of Erikson's (1963) *generativity versus stagnation* stage (Tomer, 1994). Kotre (1984) was inspired by Lifton's (1974) concept of symbolic immortality and likened the desire for generativity to the desire to live forever. Erikson himself suggested that generativity works to reduce the fear of death and to enhance a desire for immortality because it leads individuals to identify and connect with their culture (Wakefield, 1998). Unfortunately, most investigations of death anxiety in relation to Erikson's psychosocial stages focus not on generativity versus stagnation but rather integrity versus despair (e.g., Fishman, 1992; Fortner & Neimeyer, 1999), thus ignoring generativity's implicit connection to death transcendence through cultural means.

An important recent paper by Grant and Wade-Benzoni (2009) highlights a fundamental contrast in death awareness between what they refer to as death anxiety (rooted in TMT) and death reflection (rooted in generativity theory). The basic point is that death awareness, depending on contextual and psychological factors, can lead to self-protective or pro-social motivations and behaviour. These authors have postulated a contingency model of death awareness among employees in organizational and work contexts. In their model, which they derive from a close analysis of the TMT and generativity literatures, death awareness can be processed psychologically through a hot emotional system or a cold rational and deliberative system. The former system tends to trigger anxiety and fear, producing defensive, self-protective motivation; the latter, on the contrary, produces generative and pro-social consequences. This model has a complex array of

propositions and predictions about the personal and contextual factors that strengthen the probability of a hot or cold response, but a strong prediction is that older employees are more likely to be generative and pro-social.

Present Study

Given prior theory linking generativity strivings to death transcendence, in the present study we examined the role of generativity in managing existential fear among older adults. Maxfield et al.'s (2007) findings were that a subtle mortality salience induction engenders different TMT responses in older adults than a blatant mortality salience induction; accordingly, seniors in the current study who received a subtle mortality salience induction were expected to report higher levels of generativity than those receiving a blatant or no mortality salience induction after controlling for pre-induction generativity. Although Maxfield et al.'s (2014) study regarding generativity included only a subtle death prime, the present study maintained a blatant death prime in order to corroborate or disconfirm the limited prior research indicating that subtle primes engender more of an effect with older participants (Maxfield et al., 2012; Maxfield et al., 2007). In the current study, we measured baseline generativity levels with the rationale that because generativity appears to be important to most seniors, it is important to control for incoming levels of this variable. Thus, we hypothesized that in controlling for baseline generativity, generativity levels in seniors undergoing a subtle mortality salience induction would be higher than generativity levels in seniors in the blatant and control conditions.

Method

Participants

Participants were 179 older adults (57 males and 122 females) from local senior recreation centers in Edmonton, Alberta, who received \$10 for their participation. Inclusion criteria for participation were (a) being at least 60 years of age; (b) having at least one adult child with whom they remain in contact (have spoken to within the past 6 months); (c) speaking, reading, and writing in the English language for at least 20 years; and (d) having successfully completed the Cognistat (formerly known as the Neurobehavioral Cognitive Status Examination or NCSE by Kiernan, Mueller, Langston, & Van Dyke, 1987), a screening tool to detect cognitive impairment. Participants ranged in age from 60 to 89 years ($M = 72.18$, $SD = 6.78$). The criteria that participants must have at least a child controlled for the possibility that seniors who do not have children may experience generativity differently from those seniors who are parents. All but three participants lived in a

home that they owned or rented. Those three participants lived in a seniors' lodge or assisted living. The number of participants in the study was originally 186, but the sample size was reduced to 179 because five participants failed the cognitive screen (Cognistat); one participant revealed during the study that she did not have an adult child, and one participant did not want to complete the Cognistat.

Procedures and Materials

Participants completed measures individually in three sessions with a 5-minute break between sessions. Sessions took place in a quiet room in a senior centre, and most participants took no longer than 1.5 hours. Participants were told that the purpose of the study was to understand how older adults differ on various measures as well as their emotions and insights in regards to the more meaningful aspects of their lives. Each session involved completing a packet of questionnaires; the final session also included an interactive cognitive exam (i.e., the Cognistat). Before the 5-minute breaks between sessions, participants were asked to avoid cigarettes, food, or drink during the breaks that might affect their mental state. In order to standardize participants' interactions with the researcher, scripts were developed for introducing the study as well as for each of the three sessions and the debriefing.

The first session involved pre-measures that mostly served as distractors and a generativity measure that assessed participants' incoming generativity levels. Though there would have been greater consistency in using the same generativity scale both prior and subsequent to the manipulation, the short delay between sessions would have likely resulted in practice effects, so we used two different (but conceptually similar) generativity measures. The initial generativity measure (generativity items from Hawley's [1988] Measures of Psychosocial Development; MPD) was used to assess generativity levels prior to the experimental manipulation in the second session. By assessing initial pre-manipulation generativity levels in session one using the MPD and using that as a co-variate, we were able to remove the "noise" or "undesirable variance" (Tabachnick & Fidell, 2007, p. 380; see Miller & Chapman, 2001) from the second measure of generativity in session two (the Loyola Generativity Scale [LGS]; McAdams & de St. Aubin, 1992). The LGS served as the dependent variable that would be influenced by a subtle death prime, a blatant death prime, or control. The third session assessed cognitive decline as a screener for participation, and a demographic questionnaire that included age, gender, education level, marital status, annual income, religious behaviours and spirituality.

Session 1

In the first session, all participants completed pre-measures including the Rosenberg (1965) Self-Esteem Scale ($\alpha = .86$), Sheikh and Yesavage's (1986) Geriatric Depression Scale ($\alpha = .72$), Long and Martin's (2000) adaptation of the Attachment Style Measures by Hazan and Shaver (1987; $\alpha = .49$), and items representing the syntonetic disposition of the seventh stage (i.e., generativity) from Hawley's (1988) Measures of Psychosocial Development (MPD; $\alpha = .82$). These pre-measures served as fillers and distractions with the exception of the generativity measure (the MPD) that was used to measure pre-manipulation generativity levels.

Session 2

The second session consisted of the TMT manipulation. Using a computer program random number generator, participants were assigned to one of three conditions by a research assistant so that the primary researcher was blind to condition. The three conditions were a subtle mortality salience condition (MS Subtle), a mortality salience condition (MS Blatant), and a control condition (Control). The MS Subtle induction (see Maxfield et al., 2007) consisted of a word search puzzle with instructions asking participants to find a number of neutral words from a matrix also containing six death words (e.g., death, burial, corpse) that participants were not asked to find. The MS Blatant condition was the same as that used in prior research (e.g., Rosenblatt et al., 1989), and asked participants to "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." The same wording was used for the Control condition questions but referred to dental pain and not death. The purpose of using dental pain as the Control condition was to assess whether the effect of increased generativity is specific to thoughts of death as opposed to other aversive thoughts.

Participants then completed the LGS (McAdams & de St. Aubin, 1992; $\alpha = .88$). An item on the LGS involving participants' volunteer behaviour was altered to ask about their *desire* to volunteer in order to better capture participants' intentions regarding volunteerism. The word "die" was removed from three items but the item meanings were retained. The TMT manipulations were immediately followed by a necessary delay involving a neutral word-find and a filler Positive and Negative Affect Schedule (PANAS-X; Watson & Clark, 1994) (positive: $\alpha = .82$, negative: $\alpha = .84$). The use of this delay was based on previous findings showing that MS effects are most pronounced following a delay/distraction when death thoughts are highly accessible but not in current focal awareness (Arndt, Cook, & Routledge, 2004;

Burke et al., 2010; Greenberg et al., 1994). A secondary purpose of the PANAS-X was to determine whether the MS inductions impacted affect levels, which could then impact the dependent measures (i.e., mediation). MS inductions did not impact affect levels; none of the subscales of the PANAS-X differed by MS inductions (one-way ANOVAs; ps from .14 to .99).

Session 3

The third and final session involved the Cognistat to screen for participants who may have not completed the various measures in the study properly due to cognitive impairment. A cut-off for older adults using the Cognistat was identified by Ames, Hendrickse, Bakshi, Lepage, and Keef (2009) as a score below 65 (when the 10 subscale raw scores are totalled) indicating marked cognitive decline. A demographic questionnaire was filled out last and included age, gender, and education level (estimated total number of years of formal education). Consistent with Maxfield et al.'s (2007) TMT study, a 7-point Likert item assessing current health (1 = very poor to 7 = excellent) was included. Participants were also asked whether they were married, common-law, separated, divorced, widowed, or never married as well as their number of children and grandchildren. Annual income information was also gathered on a 7-point scale of equal intervals ranging from below \$20,000 to above \$120,000. Three questions regarding religious behaviours (Markides, 1983) were included with one additional question addressing level of spirituality. The demographic questionnaire was filled out last. Participants were thanked, debriefed, and given \$10.00 for their participation.

Results

Prior to analysis, we examined the data for missing data, outliers, and violations of statistical assumptions. Outliers were not excluded from the analysis and were instead changed to the mean plus or minus twice the standard deviation. The data from one participant were excluded from the study because of a string of missing items on the LGS post-manipulation generativity measure. Otherwise, there were no missing data. To test for violations of statistical assumptions, histograms, box plots, and P-P plots were examined visually along with skew and kurtosis values. Not surprisingly, positive variables (self-esteem, positive psychosocial development, the secure attachment scale, and Cognistat scores) were negatively skewed while negative variables (depression, anxious attachment, avoidant attachment, and negative affect) were positively skewed. The direction of the skewed distributions is what would be expected in the wider population of healthy seniors. A bootstrap procedure was employed in the analyses of variables with substantially non-normal distributions.

Bootstrapping was done by taking 1,000 samples (with replacement) from the data set to produce approximated normal sampling distributions. The results from the bootstrap procedure did not differ substantially from the results from standard statistical procedures.

Generativity

A primary objective of the study was to determine if participants in the subtle MS condition would score higher in generativity than those in the blatant MS condition and control condition after co-varying pre-experimental generativity. The generativity subscale of the Measures of Psychosocial Development (MPD) was used as a co-variate in a one-way analysis of covariance examining differences between the three conditions (Blatant, Subtle, Control) on the LGS. The three conditions did not differ on the generativity subscale of the MPD; (Subtle, $M = 27.13$, $SD = 4.57$; Blatant, $M = 28.10$, $SD = 4.24$; Control, $M = 28.32$, $SD = 4.57$, $F [2, 176] = 1.30$, $p = .24$, $\eta^2 = .015$). The correlation between the MPD and the LGS generativity scores was statistically significant, $r (176) = .714$, $p = .001$.

Testing our primary hypothesis, there was a trend towards a statistically significant effect of assigned condition on LGS generativity levels after controlling for the effect of the MPD generativity scores prior to the MS induction, $F(2, 174) = 2.59$, $p = .078$, $\eta^2 = .03$. Pre-adjusted LGS means were for the MS Subtle group $M = 78.98$ ($SD = 10.31$), MS Blatant group $M = 78.15$ ($SD = 11.09$), and Control group $M = 78.22$ ($SD = 9.52$). Helmert contrasts were employed that compare the mean of the first group against the combined means of the second and third group, then the mean of the second group against the mean of the third group.

The first Helmert contrast revealed a statistically significant difference between the MS Subtle group versus the MS Blatant and Control groups, $t(176) = 2.60$, $p = .025$, 95% CI [0.34, 4.87], indicating that those in the MS Subtle group ($M_{adj} = 80.19$) had higher levels of generativity as measured by the LGS than those in the MS Blatant ($M_{adj} = 77.74$) and Control ($M_{adj} = 77.44$) groups after co-varying pre-induction generativity as measured by the MSPD. A second Helmert contrast found no difference between MS Blatant and Control groups on the LGS after co-varying MSPD scores, $t(176) = .30$, $p = .818$, 95% CI [-2.29, 2.89]. Adding age as an additional co-variate resulted in age being a statistically significant co-variate, $F (1, 173) = 5.59$, $p < .02$, $\eta^2 = .03$, but the condition manipulation was affected only modestly, $F (2, 173) = 2.67$, $p < .07$, $\eta^2 = .03$, and the contrast tests produced the same pattern of results as when age was not added as an additional co-variate.

Discussion

The results of this study support the hypothesis that having older adults think about their death via a Subtle MS induction would lead them to higher ratings of generativity. As predicted, higher generativity was found only for participants assigned to a subtle MS induction group as designed by Maxfield et al. (2007). This finding builds upon Maxfield et al.'s assertion that "older adults do not cope with reminders of their mortality in the same way that younger adults do" (p. 350). Maxfield et al.'s study illustrated that including seniors in a TMT study that does not incorporate developmentally relevant constructs will engender results which are inconsistent with those derived from younger populations and which are difficult to interpret. The current findings indicate that seniors appear to respond to subtle death reminders when a developmentally relevant construct such as generativity is introduced into the research design. Although additional research as well as a younger comparison group is necessary to replicate and deepen these findings, this study contributes to existing research in the area by including both a subtle and blatant death prime as well as a baseline measure of generativity prior to experimental manipulation of this multifaceted construct.

The efficacy of the subtle death reminders as compared to the blatant death reminders in this study suggests a number of concerns and ideas in relation to further research with older adults. First, as Maxfield et al. (2007) argued, due to their more frequent exposures to death reminders (e.g., funerals, hospitals, aging), it may be that older adults have found ways to resolve the impact of death thoughts on a conscious level yet are still vulnerable to death thoughts on a more subtle, less conscious level. Future researchers within the TMT tradition are encouraged to continue to use Maxfield et al.'s (2007) subtle death prime to replicate findings with older adults. Beyond replication, however, it is also necessary to deepen the theoretical understanding of the cognitive processes involved in this particular manipulation and its unique impact on older participants.

It is certainly possible that seniors have habituated to more blatant reminders of death. As has been the case in several previous studies with older adults (e.g., Corr, Nabe, & Corr, 1994), participants in the current study were observed on several occasions making references to death without knowing that death anxiety was the main focus of the study, though this was not systematically measured. If seniors are potentially more desensitized to death content than younger populations, the first step in the TMT dual process model (conscious suppression of thoughts via "proximal defenses" such as distraction or cognitive reasoning) would be unnecessary

for seniors, thus precluding subsequent processes. Future research needs to examine these intricate processes among younger and older samples more carefully in the context of the TMT's dual process model.

Another possibility is that seniors use entirely different proximal defenses than younger adults when considering their own death thoughts. As Hayes et al. (2010) pointed out, Wegner's (1994) research on thought suppression indicated that active attempts to remove thoughts from conscious awareness causes an escalation in these unwanted thoughts. Indeed, Wenzlaff and Wegner (2000) concluded that not only is thought suppression ineffective, it is counterproductive and is a contributing factor in psychopathology. Wenzlaff and Wegner's experimental research has elucidated in numerous studies how these processes of attempting consciously to control or suppress unwanted thoughts and images, which they have labeled ironic mental processes, can substantially worsen anxious and depressive emotional states and increase the probability of painful, intrusive, and unwanted thoughts.

Thus, it is possible that over time, seniors have given up on these counterproductive cognitive strategies and have even replaced them with more adaptive mechanisms. Humour regarding the topic of death, for example, was observed in many of the participants during the debriefing in the current study and may be one alternative strategy to thought suppression. Vaillant (2002) viewed human development as evolving from immature and maladaptive coping mechanisms (e.g., passive aggression, acting out, projection) to more adaptive and "mature" (p. 62) defenses such as humour and altruism. These conclusions were derived from the *Grant Study* of adult development at Harvard University (Heath, 1945) that showed an increase in both altruism and humour and a decrease in immature defenses over a 25-year period. Preliminary research examining aging and humour specifically has indicated that humour may be an adaptive coping mechanism to assist older adults in enhancing their quality of life and reducing stress associated with aging (Shammi & Stuss, 2003), but further research will be required to deepen our understanding of humour in the lives of older adults. Continuing to examine those strategies described by McCoy et al. (2000) (e.g., downward adjustment of standards, cognitive reframing) may be useful in determining how seniors appear to demonstrate some immunity to the death thought accessibility commonly produced by blatant death primes. Further research is needed to explore why subtle death primes seem to prompt the cognitive sequence needed to employ distal defenses in older adults whereas blatant death primes do not.

The chosen dependent variable in the current study may have also been important in the current study's results.

In their development of the LGS, McAdams and de St. Aubin (1992) incorporated “many of the most salient ideas in the theoretical literature on generativity” (p. 1007). These ideas included passing knowledge and skills to others, making contributions to community, engaging in activities that create a lasting legacy, being creative and productive, and caring and taking care of others. These salient ideas within the LGS corroborate Erikson’s (1998) view of generativity that included procreativity, productivity, and creativity, and Kotre’s (1984) understanding of generativity as comprising biological, parental, technical, and cultural components. Even Becker’s (1973) four levels of power (personal, social, secular, and sacred) parallel many of the theoretical components of generativity as they evolve from more individualistic to global constructs. Individual and cultural components of generativity are important aspects of both these frameworks, with the ultimate goal of the developmental process being a move beyond the self towards a more global sense of concern called grand-generativity (Erikson), cosmic heroism (Becker), or cultural connection (Kotre). Indeed, the LGS seems to include the cultural component of generativity, and both Erikson (Wakefield, 1998) and Kotre (1984) have argued that it is this global form of generativity in particular that contributes to a sense of death transcendence. As expressed by Kotre (1984), “There is no way to outlive the self without the vehicle of culture” (p. 269).

Along with methodological and theoretical considerations, results from the current study have practical implications as well. Seniors who were given subtle death primes appeared to cling more tightly to the idea that they have lived (and currently live) a more generative life than those who were asked a control (or blatant) question. TMT researchers have believed that strengthening an individual’s cultural anxiety buffers may be the most effective way to reduce concerns regarding mortality (Solomon, Greenberg, & Pyszczynski, 1991). Thus, if generativity is an effective death anxiety buffer for older adults, TMT would suggest that enhancing generativity in later life would enhance psychological functioning as well. This line of reasoning is consistent with Erikson’s theory as he believed generativity to be associated with well-being and psychological health (McAdams, 2000).

Social implications should also be considered in light of the results. Preliminary TMT research with older adults has suggested that when exposed to subtle reminders of death, seniors (unlike younger adults) become more lenient in their judgments towards moral transgressors (Maxfield et al., 2007) and strive to conceptualize themselves as having enhanced generativity (current study). In light of these findings, Freedman’s (1997) description of seniors as a “natural resource”

and aging as “an opportunity to be seized” (p. 249) (as opposed to viewing aging as a social problem) could not be more apt. Volunteerism in particular would facilitate generativity in seniors while benefiting society as a whole. Despite the fact that TMT’s application to aging is in its infancy and both theory and method need to be refined, the results of this study provide compelling evidence that generativity serves an important function on both personal and societal levels.

Although the current study corroborates the work of Maxfield et al. (2014) and builds upon their methodology with a generativity pre-measure and the inclusion of a blatant death prime, a limitation of this study was that it did not include a comparison group of young adults. Future research including not only younger comparison groups but also younger groups that are frequently exposed to death (i.e., nurses, firefighters, refugees) may glean some perspective on whether seniors habituate to death thoughts and, if so, whether this habituation occurs due to a developmental change or simply exposure to death content. Much of the TMT research to date could be replicated with older adults in order to uncover more developmental differences that occur in response to death stimuli over time.

Conclusion

Terror management theory offers intricate methodologies to shed light on expansive existential questions regarding how human beings function despite their cognitive capacity for death awareness. Empirical studies examining death attitudes in older adults originated in the mid-fifties (Feifel, 1956), and TMT studies with younger adults originated in the eighties (Greenberg et al., 1986). Only recently has the TMT research community begun to critically examine how older adults would respond to those experimental manipulations that have highlighted important trends and implications for younger adults. Maxfield et al.’s (2007) contribution of the subtle death prime indicated that TMT manipulations should be explored on other levels of consciousness since subtle primes seemed to impact seniors more than did blatant ones. We urge TMT researchers to include older adults in TMT studies but not without considering what distinguishes seniors from younger adults *prior* to conducting their research. Incorporating developmental theory into TMT research with seniors and exploring what truly matters to this population is the first step in generating sound empirical results from which to derive meaningful implications. This study found that thoughts of death heighten the importance of generativity for seniors. This finding is one that makes conceptual sense from both a TMT and developmental standpoint. It provides some guidance about how seniors might effectively cope with end-of-life issues

and validates initiatives such as psychotherapy and volunteerism that work to enhance generative functioning in later life.

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