The interaction between aging and death anxieties predicts ageism

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ABSTRACT

While aging anxiety is associated with the threat of deterioration that leads to death, death anxiety is related to the threat of non-existence and to fears from an unknown afterlife, and both anxieties can lead to ageism. The current study examined the unexplored relationship between these two existential anxieties and ageism. Measures of aging and death anxieties, ageism (in the form of ageist attitudes), and various measures of physical health were collected from 1073 older adults at the age range of 50–86. When death anxiety was low, aging anxiety was positively related to ageism, but when aging anxiety was low, death anxiety was positively related to ageism. The interaction between both anxieties and ageism remained significant after controlling for a myriad of background characteristics and physical health measures. These findings, which point at the distinctive and complementary roles that both anxieties have in connecting between one another and ageist attitudes, are discussed in light of theories on ageism.

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1. Introduction

The scientific examination of negative attitudes toward old age has mainly focused on several possible paths. Primarily, such attitudes may be measured as stereotypes and prejudice against older adults due to their advanced age, a phenomenon which is defined as ageism (Butler, 2009). However, on an intra-personal level, these attitudes may be manifested through the individual's own anxieties about growing old, which may be triggered by the aging process (Yan, Silverstein, & Wilber, 2011), or perhaps by anxieties regarding the ultimate result of the aging process, namely, death anxiety (Benton, Christopher, & Walter, 2007). While ageism is concerned with the perception of older adults as a group, the innate qualities of both aging and death anxieties are closely associated each with the other (Benton et al., 2007). However, the two are also differentiated, as aging anxiety concerns fears regarding the continual process of aging, rather than with the termination of this process. To the best of our knowledge, the connections between the three concepts have not been explored, and therefore, the current study examines the relationships between aging anxiety, death anxiety and ageism among older adults.

1.1. Ageism

While most studies which focus on ageism examine this effect among younger cohorts, ageism was also found among older adults (see Bodner, Bergman, & Cohen-Fridel, 2012), and in such cases, is termed "self-ageism". This phenomenon may be addressed by two opposing accounts. According to the comparison hypothesis (e.g., Robinson-Whelen & Kiecolt-Glaser, 1997), self-ageism can be enhancing, because it may activate self-enhancing downward comparisons. For example, healthy older adults may enhance their self-esteem by comparing themselves with a stereotype of a frail person at the same age. In contrast, the contamination hypothesis asserts that self-ageism may be detrimental to one's self-image, because people tend to increasingly incorporate negative views about age into their self-views (Rothermund & Brandstadter, 2003), and when they grow old, these views have adverse implications on the way they age (e.g., Levy, 2009).

During the last 15 years, the contamination hypothesis received more empirical support than the comparison hypothesis, as several studies have shown that older individuals, who harbor negative views of aging, report lower psychological well-being and have more physical problems such as cardiovascular events, heightened cardiovascular responses, and elevated skin conductance (e.g., Levy, 2009). Based on such findings, the theory of stereotype embodiment suggested that negative attitudes toward the aging process are internalized across the life span, and upon gaining salience from self-relevance, they operate unconsciously through multiple pathways on health practices, on the

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central nervous system, and on positive self-perceptions of aging (Levy, 2009). However, the theory of stereotype embodiment did not consider parallel developments (Martens, Greenberg, Schimel, & Landau, 2004), demonstrating how death anxiety may affect perceptions of older adults.

1.2. Death anxiety, aging anxiety and ageism

Death anxiety is described as an emotional state of death aware-ness in which people experience terror as a response to the knowl-edge of their mortality (i.e., fear of the annihilation of the spirit and of the corporeal body and fear from the unknown afterlife; Cicirelli, 2006). According to the Terror Management Theory (Martens et al., 2004), as older age tends to be associated with greater susceptibility to disease, deteriorating bodily functions and death, older adults remind us of our mortality. This may lead people to report ageist attitudes in response to older adults, and in fact, three studies con-ducted by Martens et al. (2004) provide support for this line of thought. In a more recent study, Bodner and Cohen-Fridel (2014) demonstrated that fear of death was positively associated with age-ism, but once again, these studies did not consider the possibility that not only death anxiety, but also aging anxiety, may be related to higher ageism.

Aging anxiety is defined as concern and anticipation of adverse physical, mental, and personal losses during the aging process (Lasher & Faulkender, 1993). In line with the aforementioned con-nection between both aging and death anxieties, the former was found to be partially correlated with the latter (Benton et al., 2007), as well as with ageism, as previous studies demonstrated that higher levels of aging anxiety contribute to greater ageist atti-tudes (Allan & Johnson, 2009; Allan, Johnson, & Emerson, 2014; Boswell, 2012; Harris & Dollinger, 2001). Therefore, aging anxiety is only partially correlated with death anxiety, as it may remind peo-ple that life is coming to an end, but unlike death anxiety, it is not di-rectly associated with the absolute and irreversible meaning that life has come to an end (Lasher & Faulkender, 1993; Yan et al., 2011), and unlike death anxiety, it is not associated with the fear from the un-known afterlife.

While some studies attempted to link the two anxieties with age-ism (Allan et al., 2014; Bodner & Cohen-Fridel, 2014; Martens et al., 2004), no study has yet examined their interactive effect on the per-ception of older adults. When one attempts to hypothesize regarding the interconnections between the two anxieties and ageism, it would seem plausible to assume that in line with the positive correlation between them, individuals who report high levels of both anxieties would be those who also demonstrate the highest levels of ageism. However, ageism has been designated as a mechanism which wards off death anxiety (Martens et al., 2004), and as such, may be limited in its ability to alleviate the combination of high aging and death anxieties (which, under this assumption, would require more powerful defenses). Basing this line of thought on current theoriza-tion of the Terror Management Theory (Maxfield, John, & Pyszczynski, 2014), high levels of death-related anxieties may evoke symptoms of psychological distress in the form of depression, phobic and compulsive reactions, or in self-medication through alco-hol and other drugs, somatization, etc. (e.g., Strachan et al., 2007) in-stead of activating social defenses (in this case, ageist attitudes). On the other hand, when only one of the two anxieties is high and the other is low, ageism may prove to be a sufficient tool for warding off the individual's respective anxiety and may therefore be positive-ly associated with the dominant anxiety. In other words, we contend that the interaction of death and aging anxiety would prove to be a significant predictor of ageism. More specifically, the relationship between one anxiety and ageism would be stronger for individuals low on the other anxiety.

1.3. The current study

The current study was set to explore the interactive roles of the two anxieties in affecting ageist attitudes. We sampled participants with a mean age near 60 years following studies showing that aging anxiety (Yan et al., 2011) and ageist attitudes (Bodner et al., 2012) are consider-ably high at these ages. Following Martens et al. (2004), we contend that death anxiety may increase ageist attitudes, but suggest that aging anx-iety may also contribute to ageist attitudes and that the effect of each anxiety on ageist attitudes may be mitigated by the other. Therefore, our hypotheses are as follows:

(1) Aging and death anxieties would be positively related to ageism.
(2) The positive relationship between one anxiety and ageism would be moderated by the other anxiety, so that the relationship be-tween aging anxiety and ageism would be stronger for individ-uals low on death anxiety than for individuals high on death anxiety, and vice versa (i.e., a stronger death anxiety–ageism re-lationship for those low on aging anxiety).

2. Method

2.1. Participants and procedure

The sample was a convenience sample that included 1073 community-dwelling Israeli Jews. The mean age was 58.15 (SD = 5.32, range = 50–86) and 56.1% (n = 596) were women. In terms of ed-ucation, 10.6% (n = 114) had less than full high school education, 22.9% (n = 246) had full high school education, and 66.5% (n = 713) had col-lege education. In terms of marital status, 83.0% (n = 891) were mar-ried, 10.1% (n = 108) were divorced, 4.5% (n = 48) were widowers, and 2.4% (n = 26) were single.

Participants completed the questionnaires in Hebrew at their homes or at other venues convenient to them. The research assistants were asked to administer the questionnaires to community-dwelling older adults (at least 50 years old) who were free of severe cognitive impair-ment. Participants' anonymity was guaranteed as their names were nei-ther required nor noted in the questionnaires. Informed consent had been obtained from all participants prior to completing the questionn-aire. The study received ethical approval by an institutional review board of the author's university.

2.2. Measures

Aging anxiety was measured by the shortened version of the Kafer Aging Anxiety Scale (Kafer, Rakowski, Lachman, & Hickey, 1980) con-structed and validated by Yan et al. (2011). The Hebrew adaptation of this measure was agreed upon by three judges after examining a trans-lation from English into Hebrew as well as an independent reverse translation. This 6-item scale (e.g., "the older I become, the more I worry about my health"; "I worry about not being able to get around on my own when I'm older") is rated from 1 (strongly disagree) to 4 (strongly agree). The final score was based on the average of answers. Higher scores reflect high aging anxiety. Cronbach's α was 0.85.

Death anxiety was measured by the Fear of Death Scale (Carmel & Mutran, 1997). The original scale was constructed in Hebrew. This 6-item scale (e.g., "I am very afraid of death"; "the fact that death means the end of everything that I know frightens me greatly") was rated from 1 (completely disagree) to 5 (completely agree). The final score was based on the average of answers. Higher scores reflect high death anxiety. Cronbach's α was 0.87.

Ageism was measured by the revised Fraboni Scale of Ageism (Fraboni, Saltstone, & Hughes, 1990) translated into Hebrew and recon-structed by Bodner et al. (2012). The scale included 18 items examining stereotypes against and avoidance of older adults, as well as negative

Table 1
Descriptive statistics for the study variables.

	M/%	SD	1	2	3
1. Aging anxiety	2.92	0.83	–		
2. Death anxiety	2.15	0.90	.50***	–	
3. Ageism	2.84	0.59	.30***	.30***	–
4. Age	58.15	5.32	−.00	.02	.04
5. Gender[a]	56.1%	–	.15***	.12***	−.06*
6. Education[b]	4.02	1.13	−.12***	−.13***	−.11***
7. Marital status[c]	83.0%	–	−.03	−.03	−.01
8. Chronic medical conditions	0.95	1.06	.09**	.04	.09**
9. Disability	0.37	0.67	.19***	.14***	.11***
10. Somatic symptoms	0.35	0.50	.32***	.30***	.18***

Note. N = 1073. Correlation values represent Pearson coefficients except for coefficients for gender and marital status that represent point-biserial coefficients and those for education that represent Spearman's rank coefficients.

[a] Coded 1 = man, 2 = woman.
[b] Coded 0 = no formal education, 1 = elementary education, 2 = incomplete high school education, 3 = complete high-school education, 4 = higher education, and 5 = academic education.
[c] Coded 1 = currently unmarried, 2 = currently married.
* $p < .05$.
** $p < .01$.
*** $p < .001$.

Table 2
Hierarchical regression analysis predicting ageism.

		ΔR^2	B	S.E.	β	t
		.054***				
Step 1	Age		.000	.004	−.001	−.028
	Gender[a]		−.101	.038	−.085	−2.639**
	Education		−.041	.017	−.078	−2.417*
	Marital status[b]		.001	.050	.000	.013
	Chronic medical conditions		.010	.019	.018	.538
	Disability		.044	.032	.049	1.369
	Somatic symptoms		.208	.043	.169	4.847***
		.095***				
Step 2	Aging anxiety		.136	.025	.191	5.360***
	Death anxiety		.129	.023	.197	5.589***
		.023***				
Step 3	Aging anxiety × death anxiety		−0.115	.022	−.158	−5.192***
Total R^2		.172***				

Note. N = 1073.
[a] Gender: 0 = male, 1 = female.
[b] Marital status: 0 = not married, 1 = married.
* $p < .05$.
** $p < .01$.
*** $p < .001$.

perceptions of their contribution to the society (e.g., "many old people are stingy and hoard their money and possessions"; "many old people just live in the past") rated from 1 (*strongly disagree*) to 6 (*strongly agree*). The final score is based on the average of answers (e.g., Lin, Bryant, & Boldero, 2011). Higher scores reflect high ageism. Cronbach's α was 0.86.

Covariates included age, gender, education, marital status, chronic medical conditions, disability, and somatic symptoms. Education was coded as 0 (*no formal education*), 1 (*elementary education*), 2 (*incomplete high school education*), 3 (*complete high-school education*), 4 (*higher education*, i.e., technician), and 5 (*academic education*, i.e., B.A. and above). Chronic medical conditions were assessed by a sum of 11 listed illnesses that participants reported to have been diagnosed by a physician. The illnesses consisted of heart disease, high blood pressure, high cholesterol, stroke or cerebral vascular disease, diabetes or high blood sugar, chronic lung disease (such as chronic bronchitis or emphysema), asthma, arthritis (including osteoarthritis or rheumatism), osteoporosis, cancer or malignant tumor, and Parkinson's disease. Disability was measured by asking respondents to rate difficulties in performing functional activities such as (adapted from Nagi, 1976) those which include stooping, kneeling or crouching, reaching or extending arms above shoulder level, pulling or pushing heavy objects, lifting or carrying heavy weights, and picking up a small coin from a table. Each activity was rated on a scale from 1 (*not difficult to perform at all*) to 4 (*extremely difficult to perform*). The final score was based on the average of answers. Higher scores reflect higher disability. Cronbach's α was 0.85. Somatic symptoms were measured by six items from the somatization subscale taken from the 18-item Brief Symptom Inventory (Derogatis, 2001). Items focused on symptoms arising from cardiovascular, gastrointestinal, and other physiological systems of the human body, which may be subjected to powerful autonomic nerves system activation. Respondents were asked to indicate on a scale from 0 (*not at all*) through 4 (*very much*) the extent to which they were troubled by such symptoms in the last two weeks. The final score was based on the average of answers. Higher scores reflect higher somatic symptoms. Cronbach's α was 0.77.

Age, gender, education, and marital status were controlled, as previous studies found them to be related to aging anxiety (Yan et al., 2011), to death anxiety (Carmel & Mutran, 1997), or to ageism (Bodner et al., 2012). Chronic medical conditions, disability, and somatic symptoms were controlled because they represent major markers of physical health that can be correlated with aging and death anxieties.

3. Data analysis

We tested our study hypotheses using the PROCESS application for hierarchical linear regression analysis provided by Hayes (2013). This is an SPSS macro that enables probing moderation effects. All continuous measures were mean-centered. The model predicting ageism controlled for the effect of age, gender, education, marital status, chronic medical conditions, disability, and somatic symptoms, entered in Step 1. We then included the main effects of aging and death anxiety in Step 2 (Hypothesis 1), and finally included their interaction in Step 3 (Hypothesis 2).

4. Results

Table 1 presents the descriptive statistics for the study variables. As can be seen, aging anxiety and death anxiety were correlated ($r = 0.50$, $p < .0001$), suggesting that they are related, albeit distinct constructs, as they have 75% unshared variance. Both anxieties were significantly and positively correlated with ageism.

Table 2 presents the results of the hierarchical linear regression analysis. In line with Hypothesis 1, which stipulated that aging and death anxieties would be positively related to ageism, the analysis demonstrated that both aging anxiety ($B = 0.136$, $t = 5.360$, $p < .0001$) and death anxiety ($B = 0.129$, $t = 5.589$, $p < .0001$) predicted higher ageism ($\Delta R^2 = 0.095$). Moreover, In accordance with Hypothesis 2, which surmised that the positive relationship between one anxiety and ageism would be moderated by the other anxiety, results indicated that the cross-product term between aging anxiety and death anxiety on ageism was significant ($B = -0.115$, $t = -5.192$, $p < .0001$, $\Delta R^2 = 0.023$)[1]. Additionally, in line with this hypothesis, plotting the interaction using PROCESS yielded that the positive relationship between aging anxiety and ageism was moderated by death anxiety (see Fig. 1) and that the positive relationship between death anxiety and ageism was moderated

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[1] In order to examine the strength of the cross-product term between aging anxiety and death anxiety on ageism, we examined another model, in which we controlled for the interactions of all the variables entered in Step 1 with aging and with death anxiety for predicting ageism. The inclusion of these interactions in the model did not change the significance of the interaction of aging anxiety by death anxiety, which still predicted ageism ($B = -.117$, $t = -4.772$, $p < .0001$, $\Delta R^2 = .019$).
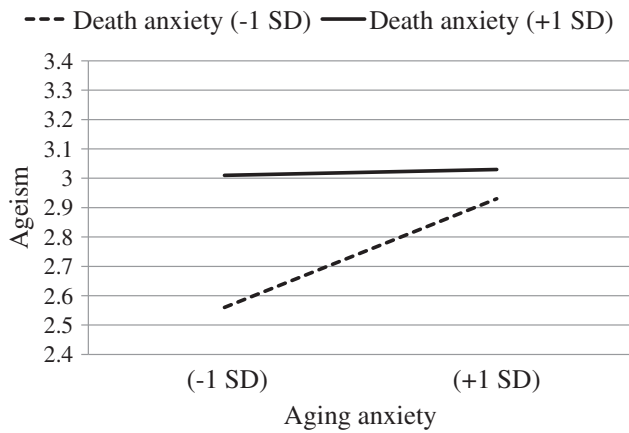
Fig. 1. The two-way interaction between death anxiety and aging anxiety on ageism (death anxiety as the moderator).

by aging anxiety[2]. That is, the relationship between aging anxiety and ageism was positive for individuals low on death anxiety, but there was no relationship between aging anxiety and ageism for individuals high on death anxiety. When plotted differently using aging anxiety as the moderator, we found that the relationship between death anxiety and ageism was evident only for those low on aging anxiety.

5. Discussion

Our model differentiates between three types of negative perceptions of aging and demonstrates that two main existentialistic concerns – death anxiety and aging anxiety – moderate ageist attitudes. While previous efforts to understand ageism focused mainly on the contribution of death anxiety to ageist attitudes (e.g., Martens et al., 2004), our study proposed that not only death anxiety, but also aging anxiety, contributes to ageist attitudes. This means that efforts to decrease ageist attitudes should not only focus on mitigating death concerns, but should consider aging anxieties as well. Moreover, our findings show that although death and aging anxieties are correlated to a similar degree with ageism and positively predict ageism, when the effect of both is combined, the dominance of one anxiety over the other nullifies the association of the other anxiety with ageist attitudes. In other words, when both of them are present, there is "room" for only one anxiety to be associated with ageism. Moreover, in a supplementary analysis we found that the association between one anxiety and ageism is increased without controlling for the other anxiety[3]. Therefore, the increased predictive validity of each anxiety when the other anxiety is low cannot be attributed to a suppression effect (where the main effect of one variable becomes *stronger* when controlling for the other variable). The mitigation of the relationship between one anxiety and ageism by the other anxiety may result from the theoretical link between aging and death anxiety. Aging anxiety was found to be directly related to the term *tangible death anxiety*, which mostly refers to changes in the body when one is dying and to the deterioration process associated with aging (Benton et al., 2007), whereas death anxiety is also related to the end of one's existence and the unknown afterlife (Cicirelli, 2006). Therefore, when both anxieties are dominant, the individual cannot handle their effect by reacting with ageist attitudes. However, due to the aforementioned qualitative difference between the two anxieties, when one shows dominance over the other, the

individual's attention is focused on its contents, and therefore, only the dominant anxiety remains strongly associated with ageism, as it may allow the individual to efficiently use ageist attitudes to ward off these existential concerns. This explanation has to be examined in future studies that will use longitudinal study designs.

While our findings regarding the main effect of both anxieties are in accordance with previous studies (e.g., Allan et al., 2014; Bodner & Cohen-Fridel, 2014; Martens et al., 2004), the significant interaction provides important information regarding the moderating effect of one anxiety on the other when predicting ageism. This is also in line with the Terror Management Theory, which contends that ageism may function as a way to decrease people's awareness of their own mortality and that such awareness is being activated by their existential concerns (Martens et al., 2004). This theoretical stance is in accordance with the contamination hypothesis, mentioned earlier, which stresses the negative long-term outcome of self-ageism, since older individuals become increasingly unable to project these negative ageist attitudes on the out-group and cannot separate themselves from their own age group (e.g., Levy, 2009). Accordingly, future studies may examine whether ageism does function as a mechanism which mediates between death and aging anxieties and measures of self-esteem and well-being in younger and older adults, and whether, according to the predictions of the Terror Management Theory and of the comparison hypothesis, it has a positive effect on self-esteem and on well-being, or if on the contrary, according to the contamination hypothesis, it has a negative effect on these measures. It would also be interesting to examine the different roles of the mechanism of ageist attitudes among younger and older adults, as it is possible that among younger adults, who are less close to their future aging self or to the end of their lives, it may still be effective in maintaining self-esteem and well-being.

Our model can be further developed by referring to the multidimensionality of its constructs. For example, aging anxiety can be examined according to four different dimensions (fear of old people, physical appearance, psychological concerns, and fear of losses; e.g., Lasher & Faulkender, 1993), which were shown to be generally comparable across age and gender (Sargent-Cox et al., 2014), and death anxiety — according to three other dimensions (intrapersonal, interpersonal, and transpersonal, e.g., Florian & Mikulincer, 1997). Similarly, Benton et al. (2007) found various associations between different dimensions of aging anxiety and fear of death. In addition, North and Fiske (2013) recently suggested (North & Fiske, 2013) a new instrument which assesses ageism through three different factors (consumption, succession, and identity). These directions are now open to further exploration following the current validation of the basic model. Future studies may wish to extrapolate our findings in this manner, as well as examine their reproducibility among other samples.

Our findings should be considered in light of the study's limitations. First, we used a convenience sample mainly composed of healthy community-dwelling older adults at the age range of 50–86. It is recommended that future studies will examine the model on representative samples using a wider age range and expand the examination to other populations of older adults, such as institutionalized people. In addition, we tested our model only on Israeli older adults. Therefore, it is recommended that future studies will examine the model in other cultures.

Our findings may hint at the importance of relating to aging and death anxieties as a way to prevent ageist attitudes. First, one has to consider that aging and death anxieties are strongly related to ageism, and therefore, both anxieties should be considered in the prevention of ageist attitudes. Second, one should bear in mind that when people report both high aging and death anxieties, these anxieties are not associated with ageism, as they may be too overwhelming to the individual who cannot use ageism as a social defense against them and may evoke various manifestations of mental distress (Maxfield et al., 2014). Hence, when people report both high aging and death anxieties, it may be beneficial to concentrate first on the alleviation of mental distress caused by

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[2] As the graphs for the two interactions closely resemble one another, Fig. 1 provides an accurate display of the effects of both.

[3] After controlling for the other covariates, ($B = 0.198$, $t = 8.595$, $p < .0001$) predicted higher ageism ($\Delta R^2 = 0.067$). Also, after controlling for the other covariates, death anxiety ($B = 0.184$, $t = 8.747$, $p < .0001$) predicted higher ageism ($\Delta R^2 = 0.070$). These effects were stronger compared to the ones each anxiety showed when entered together to the regression equation (as reported in the text).

their intensive presence, and only then start directing efforts to prevent ageism. However, when one anxiety dominates the other, it would be better to concentrate on the dominant anxiety in order to prevent ageism. In other words, to focus interventions directed to decrease death and aging anxieties (e.g., Davis-Berman, 1998-1999) on death anxiety when death anxiety is high, and on aging anxiety when aging anxiety is high. While these existential concerns may prove to be a liability for individuals throughout the life-cycle, it seems that taking them into account becomes increasingly important as we age, and ageist attitudes gradually turn from a phenomenon aimed toward the out-group of "old people", to one which targets ourselves.

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