Journal of EVOLUTION & Technology

A peer-reviewed electronic journal published by the **Institute for Ethics and Emerging Technologies**

ISSN 1541-0099

NEGATIVE DATA FROM THE PSYCHOLOGICAL FRONTLINE

By John Schloendorn

E-mail: Zauberkugel@yahoo.com

Journal of Evolution and Technology - Vol. 14 - April 2005
http://jetpress.org/volume14/Schloendorn.html

ABSTRACT

A recent study designed to investigate a possible psychological mechanism behind the widespread indifference or opposition towards immortalism is presented. In the wider context of a psychological experiment, which is not reported in detail here, the study tested different ways to advertise immortalism, but failed to identify a superior strategy. The theory behind the study, possible explanations for the results and directions for future research are discussed.

INTRODUCTION

"Why are there so few transhumanists?", probably every transhumanist asked her- or himself at some point. Things would be easier if there were more transhumanists, wouldn't they? For the pragmatic, the question then becomes "How can we make more people interested in transhumanism?", i.e. a marketing question.

Here, I report on my recent investigation into these questions, and especially their sub-questions "Why are so few people committed to greatly increase the human healthy life span?" and "how can we change that?". This important field of transhumanism should strongly benefit from more supporters, and especially from rich supporters. There does not seem to be a lack of ideas, how mammalian aging might be reversed, but rather a lack of people willing to develop these ideas or fund their development. A prime contemporary example for this is the multitude of ideas developed by rejuvenation research pioneer Aubrey de Grey and his desperate calls for people to personally and financially support his work.[1]

The commitment to augment our healthy life spans indefinitely using biomedical means (hence 'immortalism') is so straightforward and obvious for me, that I have always been particularly baffled by the observation that it is shared by very close to zero other persons. Our mythology is brimming with stories of indefinite youth, such as in the world religions that promise an afterlife free from physical suffering, or on occasion even in the modern science fiction literature[2]. But barely anyone seems to deem these scenarios desirable enough to actually work to bring them about, in the here and now. Enormous research budgets are used to analyze, catalogue and even attempt to treat individual degenerative diseases, but only a minute fraction of the efforts are thrown at attempts to actually reverse the underlying cause, which is the aging process itself.[3]

Thus, I naturally suspected that a distinct psychological mechanism might be at work here. I believe it was first hypothesized by Mike Perry, somewhere in the depths of his vast book (Perry, 2000), that psychological mechanisms that normally serve to manage the fear of death might go awry when humans are confronted with the prospect to live forever and preclude the formation of the commitment to do so.

This sparked my interest in terror management theory (TMT). TMT is a well established experimental psychological paradigm, which holds that humans experience a clash between our inbuilt fear of death, and our unique ability to foresee that death is ultimately inescapable. (Solomon et al. 2000) It seems reasonable to expect that evolution fitted us with a psychological mechanism to manage the permanent existential terror that might result from this insight. According to TMT, this is accomplished by our cultural world views. When we perceive ourselves as a valuable part of a meaningful and lasting cultural world, we may obtain self-esteem that is capable to outshine our existential fears and thereby drive our attention away from our personal impermanence. Elsewhere, I discussed evolutionary aspects of TMT in more detail. (Schloendorn, 2003)

Various predictions of TMT have been testified in a considerable number of experiments. (Greenberg et al. 1997) Anxiety-buffer studies demonstrate that threats to self-esteem engender anxiety (Greenberg et al. 1986), anxiety motivates the defense of self-esteem (Gollwitzer et al. 1982) and that such defense can alleviate anxiety (Mehlman and Snyder, 1987). Mortality-salience studies, on the other hand, demonstrate that reminders of mortality lead test subjects to bolster their culturally established world views. Mortality salience has been demonstrated to increase positive evaluations of those who affirm one's own cultural world view and negative evaluations of those who threaten it (Rosenblatt et al. 1989), ingroup bias (Harmon-Jones et al. 1996), percieved consensus for one's own beliefs (Pyszczynski et al. 1996), reluctance to violate cultural norms (Greenberg et al. 1995), and aggression towards those who violate one's cultural world view (McGregor et al. 1998).

This led me to suggest a mechanism by which terror management might compromise the advertisement of immortalism. (Schloendorn, 2003, chapter 4) If exposure to the prospect of physical immortality can trigger increased awareness of our current mortality and a terror management response, then three things might happen:

Anxiety buffer effects might suppress the perception of mortality as a problem and thereby reduce the need to find a solution. Mortality salience effects might reduce the disposition to embrace new cultural concepts, such as immortalism or transhumanism. Mortality salience effects might discredit the transgressor of cultural norms that a transhumanist or immortalist necessarily is.

According to this mechanism, valuable cognitive resources would go their various ways to suppress and deny the problem of death, thereby ironically adding to the problem, rather than solving it. Accordingly, I called this new offshoot theory 'Terror Mismanagement Theory' (TMMT). (Though recognizing that at present it has the status of a hypothesis at most.)

The internet-based experiment I report here was designed to empirically assess the validity TMMT. Although no answer could be obtained regarding this question (See results section), other results were obtained that may be of some interest to transhumanist advertisers. These results came from a section of the experiment, in which participants were presented different primer questions, designed to modulate their set of accessible thoughts, and then asked to evaluate immortalism. If one primer preceded on the average higher ratings of immortalism, then this could indicate a good general strategy to advertise immortalism on the internet.

METHOD

Participants. The questionnaire was listed at 'The Social Psychology Network' (www.socialpsychology.org) and 'The Web Experiment List' (http://genpsylab-wexlist.unizh.ch) under the deliberately vague title "Personality Variables and Interpersonal Attitudes." These organizations maintain lists of web-based psychological experiments and attract participants for the experiments listed as a free service to fellow internet psychologists. Most participants were undergraduate psychology students and most psychology students are female. Such a participant composition is common in experimental psychology in general, and in terror management theory in particular[4]. The experiment was not advertised in any other way. During the runtime of the experiment of about six months, a total of 225 participants submitted results.

Procedure.

Following the guidelines given by the Social Psychology Network[5], Participants were asked for their informed consent. They were also asked to complete all questions in one sequential run, and to complete them only once. Only questionnaires with all questions completed were collected for analysis.

After providing basic demographic information, participants were presented Rosenberg's (1965) self-esteem scales. This is a set of 10 questions designed to measure dispositional self-esteem as a covariate to increase the sensitivity of the terror management experiment (Harmon-Jones et. al 1997) and to obtain information on a possible relationship between self-esteem and immortalism.

At this point, participants were randomly divided into three groups. Each group was presented a distinct set of primer questions. The answers given to the primers were not analysed. They were designed only to influence the participants' set of accessible thoughts before they would evaluate immortalism. Primers were either death, positivity, or no primer.

The primers consisted of the following questions:

Death:

- Much scientific evidence suggests that death is a person's permanent and unequivocal end. Do you think this is true? Please give reasons briefly.

- Please describe your closest encounter with death.

- Most people are scared by the thought of their own non-existence. Why do you think that is so?

Positivism:

The positivism primer was divided in several sub-classes that could eventually be measured distinctly from each other. However, I did not yet have the resources to do this. Only their combined effect was measured. Questions from all sub-classes were presented in a fixed random order.

Life questions:

- Which single circumstance makes the greatest contribution to your overall happiness?

- What of all possible activities are you enjoying most?

- What are your most important plans, or dreams, for the future?

Self-esteem questions:

- Which particular aspect of your character do you value most, and why?
- What was the greatest achievement in your life?
- Who is the person that you think you are most important to?

Open-mindedness questions:

- What was the most rewarding learning experience for you?
- Was there any particular moment when decided to overthrow your established world view? If so, please give details.
- What was the most spontaneous project you undertook in your life?

Science questions:

- What do you think was the greatest scientific discovery of all time?
- Which scientific discoveries do you think contributed most to human quality of life?
- What do you think will be the most important scientific achievement in this century?

Participants were randomly assigned to a priming condition upon enrollment in the survey. After deleting one participant's responses, because (s)he had not entered meaningful data, 95 participants remained in the 'no primer' group, 60 in the 'positivism' group and 69 in the 'death' group.

After being primed, participants went on to evaluate immortalism. They were given the cover-story of an experimental personality assessment test, which involved fictitious role playing. Participants were asked to adopt the role of a wealthy person, willing to make a contribution to a good cause, and then presented an adapted version of the Immortality Institute's sample funding request letter.[6] In this letter, a hypothetical Immortality Institute member briefly describes the goals and means of immortalism and then asks the reader for financial support.

Participants were then asked to rate of five point scales:

- How much they agreed with the goals described in the letter.
- How likely they would support the author.
- How much money, if any, they would donate.

A composite measure was calculated by addition, which is hence referred as 'i-score'.

The questionnaire went on with a few additional questions that I will not detail here.[7] Most were either cover questions or terror-management questions, which obtained no results. The primary result, with which this essay is concerned had by now been collected.

Some of the terror management work was incorporated in distinct studies. The key terror management questions to be addressed by all studies together were:

1.) Are immortalists terror-management deficient?

2.) Can mortality salience adversely affect subjects' evaluation of immortalism?

3.) Can immortality salience trigger a similar effect as mortality salience?

4.) If the answer to 2.) and 3.) is yes, can the effect be compensated or overcompensated by appropriate priming?

RESULTS

The attempt to replicate a standard terror management experiment from the literature as a positive control failed. Although the questionnaire was replicated nearly to the letter as well as in certain variations, the number of participants was considerable and means were distinct, intrinsic variance within groups remained too high to make the result significant.[8] It may be that the internet is not sensitive enough to conduct this type of experiment. This idea is to some degree supported by the fact that despite intensive efforts, I have not found any reports of internet-based terror management experiments. All successful terror management work reported in the literature that I am aware of was conducted either in laboratory settings or in defined public places (Pyszczynski 1996).

In conclusion, it was not possible to obtain results that could be interpreted to answer the terror management related questions.

The assessment of the death- and positivism primers on the advertisement of immortalism did yield interpretable results. The frequency distribution of combined immortality score (i-score) roughly followed an exponential decay with slight extremism added at both ends. Minimal i-score was by far the most frequent choice. (Figure1) Each of the three sub-measures (agreement with the goals, likelihood of support and magnitude of financial donation) showed similar distributions.

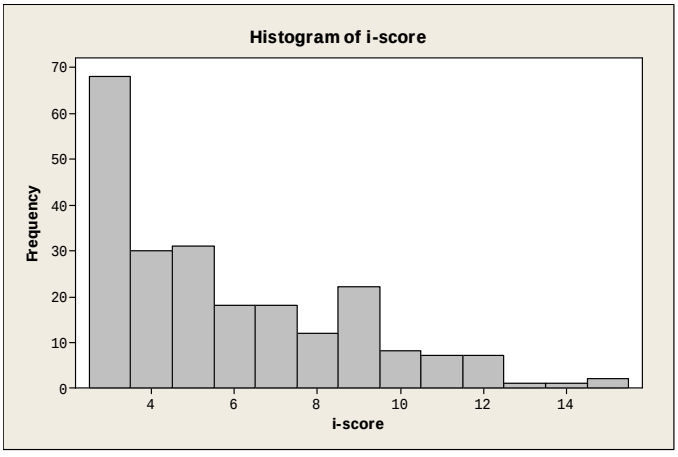

Figure1: Frequency distribution of combined immortality score

(i-score) among all test subjects.

One-way ANOVA revealed that the primer condition (no primer vs. positivism primer vs. death primer) had no significant effect on i-score ($p>0.3$). Each of the three sub-measures (agreement with the goals, likelihood of support and magnitude of financial donation)

behaved similarly vs. primer (all p>0.2) and correlated strongly with the other two sub-measures. (all ANOVA p<0.0001).

To explain some of the variance in the ANOVA, a general linear model (GLM) was calculated using Rosenberg's self esteem scales, age and gender as additional factors. In this model, the primer condition still had no significant effect on i-score (p>0.6) or its sub-measures. Self-esteem and age also had no significant effect. (p>0.9 and p>0.5, respectively) Gender did have a significant effect (p<0.02), indicating that males (mean i-score: 6.33) are more supportive of immortalism than females (mean 5.67).

DISCUSSION

The transhumanist readership probably knows from their own experience that most people exhibit no or nearly no immortalism at all. This is well reflected by the i-score frequency distribution (Figure1). It is equally well known that immortalists are mostly males. Similar results have been reported in a survey relating to cryonics. (Badger, 1998) The raw findings of this survey are thus as expected, which provides some validation for the method used.

It could be argued that the complicated decision process towards making a charitable donation can potentially introduce many variables that make the advertisement success hard to measure. (Bendapudi et al. 1996) However, in the end, it must be the goal of immortalist advertisement to make its target contribute to immortalism, i.e. initiate and complete a decision process similar to that of charitable donation. But it could be counted as a preliminary success if only an early stage of that process could be induced. This is why the three measures were assessed separately. It was found that neither general agreement, nor the likelihood for any kind of support, nor a specific financial contribution could be elicited by the primer questions. This, and the observation that the three sub-measures correlated strongly with each other, is consistent with the idea that similarity of values with the beneficiary can result in greater charitable contributions. (Bendapudi et al. 1996, 42)

Another potential objection to the method derives from the fact that the web-based setting used turned out to be inappropriate for the terror management part of the experiment. Thus it must be asked whether it is then appropriate for the immortalist advertisement part. I suggest that it is, because a large fraction of immortalist and transhumanist advertisement is actually taking place on internet pages. Therefore, these equally internet-based findings are directly relevant to transhumanists' preferred form of advertisement.

One positive finding in this study (confirming at least one other, Badger 1998) was the effect of gender on immortalism, raising the question why females show even less immortalism than males do. It may be helpful to understand this in the context of existing literature on gender effects on death, aging and health attitudes.

The effect of gender on death attitudes is complex. Although females sometimes exhibit more negative attitudes to death on certain sub-measurements, (DePaola et al. 2003) the effect seems to be mediated by a whole lot of intrapersonal variables. These interactions are still subject to investigation. (Neimeyer et al. 2004) Thus, a clear effect of gender on immortalism would not be predicted from death attitudes.

But since life-extension would likely correlate with health extension, and this is mentioned in the funding request letter used to evaluate immortalism with moderate emphasis, gender effects on attitudes towards biological aging and health behaviors could also be instructive. Females' attitudes towards aging in different western cultures are quite clearly and uniformly more negative than males'. (McConatha et al, 2003) This can be in part explained by the discrepancy between the physiological changes of aging and the cultural ideal of female youthful appearance. (Higgins, 1987) Immortalism could help women to meet this ideal in the future, and thus increased immortalism would be predicted form female aging attitudes.

Perhaps as a consequence of their aging attitudes, females tend to be more proactive in their health behaviors than males in different cultures (Ray-Mayumder, 2001). If commitment to immortalism is understood as a particularly farsighted form of proactive health-behavior, this would equally predict increased immortalism in females.

In sum, the effect of gender on immortalism is different from, or even antithetic to what would be predicted from its effects on health attitudes, which are a logical correlate of immortalism and its effects on aging and death attitudes, which are its logical antagonists. Possible explanations include the idea that as far as immortalism is concerned, people simply are not logical, perhaps owing to excessive psychological coping with and suppression of the problem that aging poses for personal well-being. For example, the acceptance of aging as inevitable and normal can correlate with the ability to maintain a positive sense of self. (McConatha et al. 2003, 205) This is compatible with females' more concerned aging and health attitudes, which may prompt more excessive irrational coping in the face of the inevitability of aging. An additional part of the problem may be inadequate communication of the idea that human life extension would likely correlate with healthy life extension. If participants suspected that real anti-aging medicine would bring them only a prolonged period of physical frailty, then the findings would be equally explicable. This almost cries for further investigation. Gender effects might end up being a useful thread through the swamp of immortalist marketing research.

It has long been debated among immortalists, whether it is better to start advertising with the badness of death, or the goodness of life. According to these findings, at least for internet-based advertisement, it does not matter.

Like others who spent considerable time studying this issue[9], I have not heard of anyone ever being persuaded that life extension, or in fact life in general, is desirable. The findings of the present study provide support for this more or less intuitive idea. The priming of obvious points for immortalism, namely the goodness of life and the badness of death had no effect on subjects' the measure of immortalism used.

It may be that a given person's disposition towards immortalism reflects characteristics of her personality that are so fundamental as to be inaccessible to the direct and brief advertisement strategy employed in this study.

As long as an effective general form of advertisement cannot be found, one might feel tempted to abandon the course of persuasion of arbitrary persons to embrace transhumanism. Rather, advertisement could focus on targeting those already predisposed to transhumanism and inform them of the possibility that their goals may not be as unrealistic as they think. The identification of suitable target groups is of foremost importance here. Both short surveys of the transhumanist community and simple 'similar interests' - search engines on the internet could be valuable tools to do this. You may not be surprised that I currently have work in this direction underway. Preliminary results, for example, indicate a substantial bias of immortalist community members towards people with a background in computer science.[10]

Perhaps, meaningful terror management experiments should be initiated in an appropriate laboratory setting. If any reader has access to suitable infrastructure, I would be happy to hear from you.

Furthermore, disagreement with the goals of immortalism is likely an important factor limiting the numbers of active immortalists. This is supported by the tight correlation of the two forms of support for immortalism measured with the agreement with its goals. Thus, it might be worthwhile to look into other mechanisms that may drive this disagreement. I will give a brief overview of three possible such mechanisms.

One mechanism would be the view of one's own life as a closed concept with a defined end. Though unfamiliar to the transhumanist, it is possible to view one's life as a project that is inherently limited. For example, one can believe that life's purpose is exhausted after accomplishing what persons born in a similar cultural context normally accomplish. When one's cultural context is a sufficiently strong component of one's personality, there is indeed no way one could personally continue a meaningful existence after that cultural context has become exhausted. (Williams, 1973) Another example might be the desire to rear children, make sure they have a good start, and then remove oneself, so that they may fully unfold their potential. Such bounded views of one's life concept are by no means better or worse than the transhumanist open-ended view. It may be a matter of nature, nurture or active personal choice. Inherently bounded personalities have little rational requirement to live longer than they need to fathom these bounds. Such views may lie at the root of the familiar boredom argument, and have been amply debated in the context of physical immortality in the theoretic literature (Glannon 2002, Harris 2002a, Harris 2002b), but I know of no attempts to empirically validate the idea, let alone put it to a use in immortalist advertisement.

Furthermore, memetics pioneer Blackmore argued that the adoption of a set of culturally accepted memes can enhance the genetic sexual attraction of the meme carrier. (Blackmore, 1999, 78) Therefore genes should be selected that dispose their carriers to adopt preferably memes which are culturally accepted. This was proposed as a mechanism driving cultural runaway selection, accounting for the extreme sexual attraction that successful movie stars or rock musicians enjoy. (Miller, 1998) From this point of view, transhumanism could be bound by the same negative feedback mechanisms that keep any small subculture, new political movement or religious sect small. Such movements are eyed with suspicion, simply because they are small and exotic. It may thus be beneficial to explore the memetic mechanisms that allowed some small cultural movements, rather than others, to break through this doom loop and become prevalent. Utilizing the cultural acceptance of the 'science' meme to advertise transhumanism may be a way to go.

A third possible mechanism could be the need to avoid displays of self-interest in a social context. If one desires physical augmentation in general and immortality in particular, this equals desiring a huge advantage for oneself. In human history, huge advantages for one usually accompanied disadvantages for others, and thus are interpreted as egoism. To access the benefits of reciprocal altruism, however, only hidden egoistic motives were allowed, but their open admission was selected against. (Dawkins, 1989, chapter 10) Thus many people may have emotional reservations against forming a selfish desire for physical immortality. Forms of advertisement that avoid the outright desire for immortality should thus be explored. For example, the term 'regenerative medicine' has this potential, because medicine seems to be mainly about altruistically helping the needy. Physical immortality as a consequence of perfected regenerative medicine comes to mind only at closer inspection.

Of course, apart from these rather sophisticated psychological efforts, more obvious strategies of advertisement, which are already being employed, could use some empiric validation. One could, for example, ask whether it increases advertisement success to emphasize concepts like the biomedical feasibility of life extension, eternal youth over eternal old age, personal relevance due to biogerontological "escape velocity" (de Grey, 2004), etc.

Although most of the data obtained in this experiment was negative, I hope that I helped to set a trend towards professional investigation of the ancient transhumanist advertisement problem. Even though I failed to identify a superior general advertisement strategy, I strongly encourage others to attempt the same. Ardent support among the broad population is the most promising means to actualize many transhumanist dreams and make this world a much better place. Although the prospects of obtaining such support may seem slim at this time, the huge potential benefit warrants in-depth exploration of every such chance.

ACKNOWLEDGEMENTS

I am deeply indebted to Bruce J. Klein (www.imminst.org) for hosting the web experiments and extensive technical support.

Special thanks goes also to:

Dr. Eva Jonas (Ludwig Maximilian University, Munich, Germany) for advice on terror management theory and sharing the details of her experimental design.

'Dave' from the ImmInst forums for helpful comments.

Silke Huffziger for help with the statistical analysis and sharing her view on the highly controversial subject of immortalism.

An anonymous reviewer whose comments helped to clear some important conceptual points, thereby substantially improving the manuscript.

FOOTNOTES

[1] See e.g. the web pages of anti-aging pioneer de Grey A. http://www.gen.cam.ac.uk/sens/

[2] For example, refer to the fascinating works of Robert A. Heinlein

[3] For example, reversing aging or life-extension are not even considered in the mission statements of either the National Institute of Health www.nih.gov/about/almanac or the National Institute of Aging www.nia.nih.gov/aboutnia as means to increase human health, while they do encourage the treatment of individual diseases, in order to promote the what they call "healthy aging".

[4] See nearly any terror management experiment cited in this essay.

[5] http://www.socialpsychology.org/consent.htm

[6] Original version of the letter:
http://www.imminst.org/forum/index.php?act=ST&f=142&t=2312&s
adapted version of the letter: http://www.pvexperiment.bravehost.com/supplement.htm

[7] unpublished data. 2004.

[8] unpublished data. 2004.

[9] E.g. Ben Best http://www.benbest.com/lifeext/whylife.html

[10] This idea is originally from de Grey A (2004), personal communication.

REFERENCES

Badger S 1998. An Exploratory Survey Examining the Familiarity with and Attitudes Toward Cryonic Preservation *Journal of Evolution and Technology* 3. Free full text available at http://www.jetpress.org/volume3/badger.htm.

Bendapudi N, Sing SN and Bendapudi V. 1996 Enhancing Helping Behavior: An Integrative Framework for Promotion Planning. Journal of Marketing 60(3): 33-49; p. 42

Blackmore, S 1999. The Meme Machine Oxford University Press, p. 78.

Dawkins R 1989. The Selfish Gene Oxford University Press, see especially chapter 10.

De Grey ADNJ 2004 Escape velocity: why the prospect of extreme human life extension matters now. *PLoS Biology* 2(6): 723-26 Freely available at http://www.gen.cam.ac.uk/sens/CwM.pdf

DePaola SJ, Griffin M, Young JR, Neimeyer R 2003 Death anxiety and attitudes toward the elderly among older adults: the role of gender and ethnicity. *Death Studies* 27: 335-54

Glannon W 2002. Identity, Prudential Concern, and Extended Lives. *Bioethics* 16(3): 267-283.

Gollwitzer PM, Earle WB and Stephan WG 1982. Affect as a determinant of egotism: Residual excitation and performance attributions. *Journal of Personality and Social Psychology*, 43: 702-709.

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

Greenberg J, Solomon S and Pyszczynski T 1997. Terror management theory of self-esteem and cultural worldviews: Empirical assessments and conceptual refinements. *Advances in experimental social psychology*, 29: 61-139.

Greenberg J, Pyszczynski T and Solomon S 1986. The causes and consequences of the need for self-esteem: A terror management theory. In RF Baumeister (Ed.) Public self and private self (pp. 189-212) New York: Springer-Verlag.

Harmon-Jones E et.al. 1997. Terror Management Theory and Self-Esteem: Evidence That Increased Self-Esteem Reduces Mortality Salience Effects *Journal of Personality and Social Psychology* 72(1): 24-36.

Harmon-Jones E, Greenberg J, Solomon S, and Simon, L 1996. The effects of mortality salience on intergroup discrimination between minimal groups. *European Journal of Social Psychology*, 26: 677-681.

Harris J 2002a. A Response to Walter Glannon. *Bioethics*16(3): 284-291.

Harris J 2002b. Intimations of Immortality - The Ethics and Justice of Life Extending Therapies. *Current Legal Problems* 55: 65-95.

Higgins ET 1987. Self-discrepancy: A theory relationg self and affect. *Psychological review* 94: 319-40

McConatha JT, Schnell F, Volkwein K, Riley L, Leach E 2003 Attitudes towards aging: a comparative analysis of young adults from the United States and Germany. *International Journal of Aging and Human Development* 57(3): 203-15

McGregor HA, Simon L, Arndt J, Greenberg J, and Solomon S 1998 Terror management and aggression: Evidence that mortality salience motivates aggression against worldview threatening individuals. *Journal of Personality and Social Psychology*, 74: 590-605.

Mehlman RC and Snyder CR 1985. Excuse theory: A test of the self-protective role of attributions. *Journal of Personality and Social Psychology*, 49, 994-1001.

See also Miller, G. F. 1998. How mate choice shaped human nature: A review of sexual selection and human evolution. In C. Crawford & D. Krebs (Eds.), Handbook of evolutionary psychology: Ideas, issues, and applications 87-130. Lawrence Erlbaum.

Neimeyer RA, Wittkowski J, Moser RP 2004 Psychological research on death attitudes: an overview and evaluation. *Death Studies* 28: 309-40

Perry M. 2000. Forever for All. Universal Publishers, FL.

Pyszczynski T, Wicklund RA, Floresku S, Koch H, Gauch G, Solomon S, and Greenberg J 1996. Whistling in the dark: Exaggerated consensus estimates in response to incidental reminders of mortality. *Psychological Science* 7: 332-336.

Ray-Mazumder S 2001. Role of gender, insurance status and culture in attitudes and health behavior in a US chinese student. Ethnicity and Health 6(3-4): 197-209

Rosenberg M 1965. Society and the Adolescent Self-Image. Princeton, New Jersey: Princeton University Press.

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

Schloendorn J 2003. Evolution and its implications for aging, death and the extension of the human life span. The World Transhumanist Association, Haldane Paper 2003. Freely available at http://www.transhumanism.org/tv/Haldane2003.htm

Solomon S, Greenberg J and Pyszczynski T. 2000. Pride and prejudice: Fear of death and social behavior. *Current Directions in Psychological Science* 9(6): 200-204.

Williams B 1973. The Makropulos Case: Reflections on the Tedium of Immortality. In Problems of the Self. Williams, ed. Cambridge MA, Cambridge University Press: 81-100.