

# Big Data Analysis of Terror Management Theory's Predictions in the COVID-19 Pandemic

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## Abstract

The current study aimed to address the limitations of the terror management theory literature by using big data analysis to examine the theory's predictions in the COVID-19 pandemic. Specifically, Google Trends were examined before and after the first COVID-19 case was identified in Singapore. The results showed that there was a significant increase in mortality salience, intergroup conflict, and prosocial behavior, and a significant decrease in materialism after the first COVID-19 case was identified. However, no significant differences were found for anxiety. Limitations include the assumption that search terms reflect intentions that would eventually lead to a relevant behavior and the lack of data from other sources to corroborate with the results from Google Trends. Future research could use data from other sources to examine the effects of COVID-19 on theoretically relevant behaviors.

## Keywords

terror management theory, mortality salience, big data analysis, google trends, COVID-19

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## Introduction

All living things have an instinct for life. However, all living things will inevitably die. Unlike other animals, human beings are cognitively aware of the inevitability of death. According to terror management theory, the juxtaposition of an instinct of life with the awareness of death results in the potential for overwhelming anxiety (Greenberg et al., 1986). To live life with equanimity, human beings employ a tripartite security system to buffer against anxiety: a cultural worldview, self-esteem, and close relationships (Hart et al., 2005). A cultural worldview is a shared conception of reality that imbues the world with order, permanence, and meaning, provides standards of value for individuals to strive for, and promises either literal or symbolic immortality for individuals who meet those standards. Self-esteem is obtained when individuals successfully meet those standards and hence, qualify for immortality. Finally, close relationships reinforce the cultural worldview and act as a source of self-esteem.

The predictions of terror management theory have been tested via three hypotheses: the anxiety buffer hypothesis, the death-thought accessibility hypothesis, and the mortality salience hypothesis (Pyszczynski et al., 2015). Specifically, if the components of the tripartite security system act as an anxiety buffer, then high levels of those components should reduce anxiety in threatening situations (anxiety buffer hypothesis), threats to those components should increase the accessibility of death-related thoughts (death-thought accessibility hypothesis), and reminders of mortality should increase the need for those components (mortality salience hypothesis). Among the three hypotheses, the mortality salience hypothesis has received the most research attention and is the focus of the current study.

In a typical mortality salience study, participants are randomly assigned to write either about their own death (mortality salience condition) or about a neutral/negative topic (control condition) (Burke et al., 2010). Subsequently, a delay is introduced by having participants complete filler tasks or instruments. This delay is essential since the tripartite security system is only deployed by individuals when death-related thoughts are in the unconsciousness (Pyszczynski et al., 1999). Finally, participants complete measures designed to assess need for the components in the tripartite security system. This need could take the form of worldview defense, self-esteem striving, or desire for close relationships. For example, research has shown that mortality salience affects a wide range of behaviors including intergroup conflict, prosocial behavior, materialism, and anxiety (see Table 1 for a sample of relevant studies). Overall, a meta-analysis of 277 experiments yielded effect sizes that ranged from  $-.48$  to  $.99$ , with an overall effect size of  $.35$ , providing support for the mortality salience hypothesis (Burke et al., 2010).

Despite the robust evidence for the mortality salience hypothesis, there are three limitations associated with the literature. First, the typical manipulation of mortality salience is low in external validity. While it is commendable that some studies have manipulated mortality salience using a funeral home (Jonas et al., 2002; 2005; Pyszczynski et al., 1996) or real world events like the 9/11 attacks (Nail & McGregor, 2009; Stein et al., 2011), most studies invited participants to write about their own death

**Table 1.** Effects of Mortality Salience on Intergroup Conflict, Prosocial Behavior, Materialism, and Anxiety.

Behavior	Increased
Intergroup conflict	Outgroup derogation (Greenberg et al., 1990; Heine et al., 2002) Stereotyping (Hoyt et al., 2009; Schimel et al., 1999) Prejudice (Das et al., 2009; Webster & Saucier, 2011) Sympathy for a racist (Greenberg et al., 2001)
Prosocial behavior	Donation to charity for an ingroup (Jonas et al., 2002) Favorable evaluations of charities (Joireman & Duell, 2007) Willingness to spend on prosocial goals (Dong et al., 2019)
Materialism	Interest in high-status products (Mandel & Heine, 1999) Greed (Kasser & Sheldon, 2000) Appeal in products (Dar-Nimrod, 2012) Desire for money (Zaleskiewicz et al., 2013)
Anxiety	Phobic behaviors (Strachan et al., 2007) Compulsive behaviors (Menzies & Dar-Nimrod, 2017) Anxiety-related behaviors (Menzies et al., 2021)

Note. Some of the effects are moderated by individual difference variables.

(Burke et al., 2010). Second, although some studies have been conducted using non-Western samples (e.g., Chew & Yap, 2021; Ma-Kellams & Blascovich, 2011; 2012; Yen & Cheng, 2010), most studies recruited psychology undergraduates from Western, educated, industrialized, rich, and democratic societies as participants (WEIRD samples; Henrich et al., 2010). Taken together, these two limitations impose a limit on the generalizability of the results. Lastly and more importantly, most studies are confined to the laboratory and the predictions of terror management theory have seldom been tested in real world situations.

The COVID-19 pandemic provided an opportunity to address these limitations. The pandemic is caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), an infectious virus that spreads through the air. As of 4 June 2021, there are more than 172 million cases worldwide, with more than 3.7 million deaths (Google News, 2021). Given the severity of the pandemic, researchers have argued that it could act as a form of mortality salience, resulting in the deployment of the tripartite security system (Courtney et al., 2020; Pyszczynski et al., 2021). However, because of the ongoing nature of the pandemic and the reduced effectiveness of the tripartite security system during this period (e.g., unemployment lowers one's self-esteem), it was expected that the general population continues to experience mortality salience.

The argument that mortality is salient during the pandemic has been supported by the results of big data analyses in China (Li et al., 2020) and the United States (Evers et al., 2021). These studies examined mortality salience although they were not primarily motivated by terror management theory. The first study extracted the contents of Weibo, a social networking site in China, seven days before and after COVID-19 was

declared a pandemic on 20 January 2020 (Li et al., 2020). Word frequencies of emotions (e.g., anger) and concerns (e.g., death), emotional indicators (e.g., anxiety), and cognitive indicators (e.g., life satisfaction) were extracted and compared. Relevant to the current study, the results found higher mortality salience and negative emotional indicators in the seven days after the declaration. The second study extracted Google Trends and the contents of social media (i.e., Twitter, internet forums, and blogs) 70 days before and after then President Trump declared COVID-19 a national emergency on 13 March 2020 (Evers et al., 2021). Search terms and word frequencies related to mortality salience (e.g., death), subsistence activities (e.g., farm), collectivism (e.g., help), and materialism (e.g., Ferrari) were extracted and compared. Relevant to the current study, the results found higher mortality salience and collectivism in the 70 days after the declaration. However, a significant decline in materialism was only found for Google Trends but not for the contents of social media. Overall, these studies provided evidence of increased mortality salience during the pandemic.

## The Current Study

The current study aimed to address the limitations of the terror management theory literature by using big data analysis to examine the theory's predictions in the COVID-19 pandemic. While big data analyses on similar variables have been conducted, they are either atheoretical (Li et al., 2020) or based on another theory (i.e., theory of social change, cultural evolution, and human development) (Evers et al., 2021). The use of different theories might result in different, even opposing, predictions. For example, while materialism was expected to decline (Evers et al., 2021), terror management theory research predicts that materialism would increase during the pandemic (e.g., Mandel & Heine, 1999). More important, terror management theory prompted the inclusion of a previously excluded variable: intergroup conflict. Finally, the current study differed from previous studies by focusing on Singapore. The use of big data analyses on different countries could provide triangulation on the effects of COVID-19 on various psychological variables.

Building on previous studies (Evers et al., 2021; Li et al., 2020), the current study examined Google Trends before and after the first COVID-19 case was identified in Singapore. The use of Google Trends is appropriate since Singapore has an Internet penetration rate of 88.9% (The World Bank, 2019) and 96.0% of Singaporeans use Google as their search engine (StatCounter, 2021). The current study made two assumptions on the use of Google Trends as a research methodology. First, it was assumed that search terms reflect intentions to learn more about a topic with the subsequent goal of performing a relevant behavior. For example, donation-related searches reflect intentions to donate with the goal of eventually donating resources. Second, it was assumed that increases in search interest of a topic reflect increases in the occurrences of a related phenomenon. For example, increases in racism-related searches reflect increases in the occurrences of public racists incidents. Since 2006,

Google Trends has been used for research in various disciplines, including IT, medicine, health, and economics (Jun et al., 2018).

The current study had five hypotheses. Consistent with previous studies (Evers et al., 2021; Li et al., 2020), it was hypothesized that mortality salience would increase after the first COVID-19 case was identified (Hypothesis 1). Given the expected deployment of the tripartite security system in response to mortality salience (Courtney et al., 2020; Pyszczynski et al., 2021) and the extant research on terror management theory (see Table 1), it was expected that there would be an increase in intergroup conflict (Hypothesis 2), prosocial behavior (Hypothesis 3), materialism (Hypothesis 4), and anxiety (Hypothesis 5) after the first COVID-19 case was identified.

## Method

### *Google Trends*

Google Trends uses search data to provide an indicator of interest in a particular topic in a given location and time range (Google, 2021). Search data is indexed by retrieving an anonymous random sample of Google searches and given a number that ranges from 1 to 100, with higher numbers indicating higher levels of interest. Subsequently, the data is normalized by scaling that number on a range of 0 to 100 based on the percentage of searches for a particular topic as a proportion of all searches. Search data is excluded if they (a) are made by very few people, (b) are duplicate searches from the same user within a short time frame, and (c) consists of special characters (e.g., apostrophes). Google Trends distinguishes between search terms and search topics. Search topics are a collection of search terms, and they include the exact search term, misspellings, and acronyms, in all languages. Consequently, Google Trends recommends using search topics for reliability.

### *Procedure*

A series of searches were conducted on Google Trends. Keywords were first generated by the author based on the behaviors identified in Table 1, news reports (e.g., Mathews & Zainuddin, 2021) and research (e.g., Chew, 2018; Chew et al., 2019) in Singapore, and relevant websites. In particular, the top five luxury brands were retrieved from a top 10 list of luxury brands in Singapore and used as keywords for materialism (Top Ten, 2019). Keywords that are not available as a topic (e.g., “give money” is only available as a search term) or has multiple meanings (e.g., the word “give” also refers to a town in Denmark) were excluded.

Singapore had its first COVID-19 case on January 23 2020. Consequently, the 130 days before that date (September 15, 2019 to January 22, 2020) was used as the comparison duration (before COVID-19), and the next 130 days after that date (January 23, 2020 to May 31, 2020) was used as the duration of interest (during COVID-19). The 260-day duration was chosen because Google Trends only provides daily data if the

**Table 2.** Search Parameters and Keywords Used on Google Trends.

Search Parameters	
Location	Singapore
Time range	September 15, 2019 to May 31, 2020
Category	All Categories
Type of search	Web search
Keywords used	
Mortality salience	Death
Intergroup conflict	Racism, prejudice, xenophobia
Prosocial behavior	Donation
Materialism	Louis Vuitton, Burberry, Michael Kors, Coach New York, Chanel
Anxiety	Anxiety, anxiety disorder, Phobia, Obsessive–Compulsive disorder, Institute of Mental Health

Note. The Institute of Mental Health is the only tertiary psychiatric hospital in Singapore.

chosen time range is less than nine months (260 days is about eight months) (Tseng, 2019). In contrast, a time range more than nine months or five years would yield aggregated weekly and monthly data, respectively. Furthermore, the 130 days after the first COVID-19 case encompassed the peak number of new COVID-19 cases in Singapore on April 20, 2020 (Google News, 2021). The search parameters and keywords used are presented in Table 2. The procedure has been approved by the university's human research ethics committee (ethics approval number: H8496).

### Data Analyses

The data was analyzed using SPSS Version 21 with the alpha level set at .05. Consistent with previous studies (Evers et al., 2021; Li et al., 2020), the search interest scores for each keyword was summarized using mean scores for before COVID-19 and during COVID-19. Subsequently, a series of *t*-tests were conducted to examine differences in search interest between the two durations. Finally, the effect size for each comparison was calculated and quantified using Cohen's *d* (Cohen, 1988).

### Results

The search interests of various topics before and during COVID-19 in Singapore are presented in Table 3. The time series plots from Google Trends are available in the supplementary file. There was a significant increase in mortality salience, intergroup conflict, and prosocial behavior, and a significant decrease in materialism during

**Table 3.** Google Search Interests Before and During COVID-19 in Singapore.

Keywords	Before COVID-19		During COVID-19		<i>t</i> (258)	<i>p</i>	Cohen's <i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
Mortality Salience							
Death	15.25	3.96	28.09	10.50	-13.05	<.001	1.62
Intergroup conflict							
Racism	11.62	10.72	21.68	17.58	-5.57	<.001	.69
Prejudice	8.79	14.01	17.60	21.11	-3.96	<.001	.50
Xenophobia	2.21	5.55	12.15	16.39	-6.55	<.001	.81
Prosocial behavior							
Donation	31.80	16.05	38.17	16.52	-3.15	.002	.40
Materialism							
Louis Vuitton	47.72	15.45	34.82	13.07	7.27	<.001	.90
Burberry	25.39	16.94	15.79	13.64	5.03	<.001	.62
Michael Kors	22.32	21.24	11.85	18.66	4.22	<.001	.53
Coach New York	23.38	14.44	12.52	12.79	6.42	<.001	.80
Chanel	49.55	16.73	41.74	18.25	3.60	<.001	.45
Anxiety							
Anxiety	26.12	14.72	28.27	15.82	-1.13	.258	.14
Anxiety disorder	21.29	22.36	18.64	18.20	1.05	.295	.13
Phobia	22.14	22.70	21.48	23.91	.23	.819	.03
OCD	22.50	19.15	22.88	19.24	-.16	.874	.02
IMH	21.72	20.86	19.65	16.71	.88	.378	.11

Note. OCD = Obsessive-Compulsive Disorder; IMH = Institute of Mental Health.

COVID-19. The effect sizes ranged from medium to large (Cohen, 1988). However, there were no significant differences in anxiety before and during COVID-19.

## Discussion

The results provided support for the hypothesis that mortality salience would increase after the first COVID-19 case was identified (Hypothesis 1). This was consistent with previous studies that found increased mortality salience during the pandemic (Evers et al., 2021; Li et al., 2020). This might be explained by the severity of the pandemic. With over 172 million cases and 3.7 million deaths worldwide (Google News, 2021), it seems intuitive that mortality would be salient during this period. Given these results, the current study proceeded to examine the expected deployment of the tripartite security system (Courtney et al., 2020; Pyszczynski et al., 2021).

The results provided support for the hypothesis that there would be an increase in intergroup conflict after the first COVID-19 case was identified (Hypothesis 2). This was consistent with previous studies that found that mortality salience increased

intergroup conflict (e.g., [Greenberg et al., 1990](#)). This might be explained by the use of worldview defense as an anxiety buffer. Specifically, as a human invention, worldviews are fragile and require validation from similar others ([Solomon et al., 1991](#)). The presence of different worldviews raises the possibility that one's worldview is incorrect, reducing its effectiveness as an anxiety buffer. Consequently, since the pandemic reminded us of our mortality, we engaged in outgroup derogation (either via racism, prejudice, or xenophobia) to defend our worldview and maintain its effectiveness as an anxiety buffer.

The results also provided support for the hypothesis that there would be an increase in prosocial behavior after the first COVID-19 case was identified (Hypothesis 3). This was consistent with previous studies that found that mortality salience increased prosocial behavior (e.g., [Jonas et al., 2002](#)). This might be explained by the use of self-esteem striving as an anxiety buffer. The cultural worldview in Singapore places a strong emphasis on prosocial behaviors. Donating money and volunteering at charitable organizations are important elements of the worldview and are standards that we use to judge ourselves and others. Due to government restrictions during the pandemic (e.g., social distancing and lockdown), most volunteering activities were ceased, leaving donations the only option. Therefore, once reminded of our mortality by the pandemic, we engaged in prosocial behaviors (via donation) to live up to the prescribed cultural standards of value, qualify for immortality, and obtain self-esteem.

However, the results did not provide support for the hypothesis that there would be an increase in materialism after the first COVID-19 case was identified (Hypothesis 4). The results showed that there was a decreased in materialism during COVID-19. This was inconsistent with previous studies that found that mortality salience increased materialism (e.g., [Mandel & Heine, 1999](#)) but consistent with a previous big data analysis in the United States ([Evers et al., 2021](#)). This might be explained by economic uncertainty. Singapore's economy was adversely impacted by the pandemic, resulting in lower GDP growth ([Ministry of Trade and Industry, 2020](#)) and higher unemployment rate ([Channel News Asia, 2020](#)). Economic uncertainty might motivate individuals to save money and spend them on essentials instead of splurging on luxury brands. Consequently, materialism might not be the preferred behavior to satisfy one's need for self-esteem during the pandemic, especially since affordable alternatives like donating money are available.

Lastly, the results did not provide support for the hypothesis that there would be an increase in anxiety after the first COVID-19 case was identified (Hypothesis 5). The results showed that there were no significant differences in anxiety before and during COVID-19. This was inconsistent with previous studies that found that mortality salience increased anxiety (e.g., [Strachan et al., 2007](#)) and news reports of increased calls to mental health helplines during the pandemic ([Channel News Asia, 2021](#); [The Straits Times, 2021](#)). Paradoxically, this might be explained by either high or low mental health awareness among the population. The increase in mortality salience might have exacerbated a range of phobic, compulsive, and anxiety-related behaviors. With high mental health awareness, individuals are familiar with the symptoms and



would seek help by calling helplines, precluding the need for Google searches. Alternatively, with low mental health awareness, individuals might be in distress but unable to recognize the symptoms of anxiety. While they might make calls to helplines, the lack of knowledge precluded Google searches for anxiety-related topics. Clearly, more research is needed to resolve this issue.

Limitations of the study should be noted. First, the current study assumed that search terms reflect intentions that would eventually lead to a relevant behavior. While similar assumptions were made in a previous study (Evers et al., 2021), the gap between intentions and behavior is well-documented (Sheeran & Webb, 2016). For example, donation-related searches might reflect intentions to donate but not actual donation behavior. Second, no data were obtained from other sources to corroborate with the results from Google Trends. However, given the fallibility of memory, it was not feasible to collect data retrospectively on relevant variables before COVID-19 (e.g., asking participants for donation intentions before the pandemic). Future research directions could address these limitations by using data from other sources, such as actual donation behavior from charitable organizations or objective indicators of anxiety from mental health organizations, to examine the effects of COVID-19 on theoretically relevant behaviors.

In summary, the findings of this study are important because it was the first to examine the predictions of terror management theory in real world situations. Studies have manipulated mortality salience using a funeral home (Jonas et al., 2002; 2005; Pyszczynski et al., 1996) or the 9/11 attacks (Nail & McGregor, 2009; Stein et al., 2011). The current study extended on those studies by using COVID-19 as a mortality salience manipulation. Furthermore, behaviors that were traditionally assessed in a laboratory in terror management theory research (i.e., intergroup conflict, prosocial behavior, materialism, and anxiety) were assessed in real world situations via Google Trends. Overall, it appears that the predictions of the theory are moderately supported in real world situations. Consistent with previous theorizing (Courtney et al., 2020; Pyszczynski et al., 2021), COVID-19 acted as a form of mortality salience, resulting in the deployment of the tripartite security system. However, similar to the moderation of mortality salience effects by individual difference variables in the laboratory, some effects of mortality salience in real world situations appear to be affected by environmental (e.g., economic uncertainty) and individual difference (e.g., mental health awareness) variables.

### **Ethics Approval**

The procedure has been approved by the university's human research ethics committee (ethics approval number: H8496).

### **Informed Consent**

Informed consent was not obtained since the study used existing public data from Google Trends.

## Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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## Data Availability

The datasets generated during and/or analyzed during the current study are available in the Open Science Framework repository, [https://osf.io/62ach/?view\\_only=4c68c5572ba1439cbe9e323bf057920f](https://osf.io/62ach/?view_only=4c68c5572ba1439cbe9e323bf057920f)

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## Supplemental Material

Supplemental material for this article is available online.

## References

- Burke, B. L., Martens, A., & Faucher, E. H. (2010). Two decades of terror management theory: A meta-analysis of mortality salience research. *Personality and Social Psychology Review, 14*(2), 155–195. <https://doi.org/10.1177/1088868309352321>
- Channel News Asia. (2020, October 7). *Singapore's overall unemployment rate in August climbs past global financial crisis' high*. Channel News Asia. <https://www.channelnewsasia.com/news/singapore/unemployment-rate-singapore-august-covid-19-13218836>
- Channel News Asia. (2021, February 9). *COVID-19: Worries about pandemic see more calls to mental health helplines*. Channel News Asia. <https://www.channelnewsasia.com/news/singapore/covid-19-fear-toll-mental-health-hotline-anxiety-singapore-12631710>
- Chew, P. K. H. (2018). Racism in Singapore: A review and recommendations for future research. *Journal of Pacific Rim Psychology, 12*, 1–9. <https://doi.org/10.1017/prp.2018.3>
- Chew, P. K. H., & Yap, B. L. M. (2021). Mortality salience in an offline and online setting. *Death studies. Advance online publication, 23*, 1–8. <https://doi.org/10.1080/07481187.2021.1888826>
- Chew, P. K. H., Young, J. L., & Tan, G. P. K. (2019). Racism and the Pinkerton syndrome in Singapore: Effects of race on hiring decisions. *Journal of Pacific Rim Psychology, 13*, 1–7. <https://doi.org/10.1017/prp.2019.9>
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences*. Erlbaum.
- Courtney, E. P., Goldenberg, J. L., & Boyd, P. (2020). The contagion of mortality: A terror management health model for pandemics. *British Journal of Social Psychology, 59*(3), 607–617. <https://doi.org/10.1111/bjso.12392>

- Dar-Nimrod, I. (2012). Viewing death on television increases the appeal of advertised products. *The Journal of Social Psychology, 152*(2), 199–211. <https://doi.org/10.1080/00224545.2011.588273>
- Das, E., Bushman, B. J., Bezemer, M. D., Kerkhof, P., & Vermeulen, I. E. (2009). How terrorism news reports increase prejudice against outgroups: A terror management account. *Journal of Experimental Social Psychology, 45*(3), 453–459. <https://doi.org/10.1016/j.jesp.2008.12.001>
- Dong, M., Prooijen, J.-W. V., Wu, S., Zhang, Y., & Jin, S. (2019). Prosocial attitudes toward money from terror management perspective: Death transcendence through spirituality. *The International Journal for the Psychology of Religion, 29*(1), 1–17. <https://doi.org/10.1080/10508619.2018.1532267>
- Evers, N. F. G., Greenfield, P. M., & Evers, G. W. (2021). COVID-19 shifts mortality salience, activities, and values in the United States: Big data analysis of online adaptation. *Human Behavior and Emerging Technologies, 3*(1), 107–126. <https://doi.org/10.1002/hbe2.251>
- Google (2021). *Google Trends lessons*. Google News Initiative Training Center. <https://newsinitiative.withgoogle.com/training/lessons?tool=Google%20Trends&image=trends>
- Google News (2021). *Coronavirus (COVID-19)*. <https://news.google.com/covid19/map?hl=en-SG&gl=SG&ceid=SG:en>
- Greenberg, J., Pyszczynski, T., & Solomon, S. (1986). The causes and consequences of a need for self-esteem: A terror management theory. In R. F. Baumeister (Ed.), *Public self and private self* (pp. 189–212). Springer. [https://doi.org/10.1007/978-1-4613-9564-5\\_10](https://doi.org/10.1007/978-1-4613-9564-5_10)
- Greenberg, J., Pyszczynski, T., Solomon, S., Rosenblatt, A., Veeder, M., Kirkland, S., & Lyon, D. (1990). Evidence for terror management theory II: The effects of mortality salience on reactions to those who threaten or bolster the cultural worldview. *Journal of Personality and Social Psychology, 58*(2), 308–318. <https://doi.org/10.1037/0022-3514.58.2.308>
- Greenberg, J., Schimel, J., Martens, A., Solomon, S., & Pyszczynski, T. (2001). Sympathy for the devil: Evidence that reminding whites of their mortality promotes more favorable reactions to white racists. *Motivation and Emotion, 25*(2), 113–133. <https://doi.org/10.1023/A:1010613909207>
- Hart, J., Shaver, P. R., & Goldenberg, J. L. (2005). Attachment, self-esteem, worldviews, and terror management: Evidence for a tripartite security system. *Journal of Personality and Social Psychology, 88*(6), 999–1013. <https://doi.org/10.1037/0022-3514.88.6.999>
- Heine, S. J., Harihara, M., & Niiya, Y. (2002). Terror management in Japan. *Asian Journal of Social Psychology, 5*(3), 187–196. <https://doi.org/10.1111/1467-839X.00103>
- Henrich, J., Heine, S. J., & Norenzayan, A. (2010). The weirdest people in the world? *Behavioral and Brain Sciences, 33*(2–3), 61–83. <https://doi.org/10.1017/S0140525X0999152X>
- Hoyt, C. L., Simon, S., & Reid, L. (2009). Choosing the best (wo) man for the job: The effects of mortality salience, sex, and gender stereotypes on leader evaluations. *The Leadership Quarterly, 20*(2), 233–246. <https://doi.org/10.1016/j.leaqua.2009.01.016>
- Joireman, J., & Duell, B. (2007). Self-transcendent values moderate the impact of mortality salience on support for charities. *Personality and Individual Differences, 43*(4), 779–789. <https://doi.org/10.1016/j.paid.2007.02.003>

- Jonas, E., Fritsche, I., & Greenberg, J. (2005). Currencies as cultural symbols – an existential psychological perspective on reactions of Germans toward the Euro. *Journal of Economic Psychology, 26*(1), 129–146. <https://doi.org/10.1016/j.joep.2004.02.003>
- Jonas, E., Schimel, J., Greenberg, J., & Pyszczynski, T. (2002). The scrooge effect: Evidence that mortality salience increases prosocial attitudes and behavior. *Personality and Social Psychology Bulletin, 28*(10), 1342–1353. <https://doi.org/10.1177/014616702236834>
- Jun, S.-P., Yoo, H. S., & Choi, S. (2018). Ten years of research change using google Trends: From the perspective of big data utilizations and applications. *Technological Forecasting and Social Change, 130*, 69–87. <https://doi.org/10.1016/j.techfore.2017.11.009>
- Kasser, T., & Sheldon, K. M. (2000). Of wealth and death: Materialism, mortality salience, and consumption behavior. *Psychological Science, 11*(4), 348–351. <https://doi.org/10.1111/1467-9280.00269>
- Li, S., Wang, Y., Xue, J., Zhao, N., & Zhu, T. (2020). The impact of COVID-19 epidemic declaration on psychological consequences: A study on active weibo users. *International Journal of Environmental Research and Public Health, 17*(6), 2032. <https://doi.org/10.3390/ijerph17062032>
- Ma-Kellams, C., & Blascovich, J. (2011). Culturally divergent responses to mortality salience. *Psychological Science, 22*(8), 1019–1024. <https://doi.org/10.1177/0956797611413935>
- Ma-Kellams, C., & Blascovich, J. (2012). Enjoying life in the face of death: East-west differences in responses to mortality salience. *Journal of Personality and Social Psychology, 103*(5), 773–786. <https://doi.org/10.1037/a0029366>
- Mandel, N., & Heine, S. J. (1999). Terror management and marketing: He who dies with the most toys wins. *Advances in Consumer Research, 26*(1), 527–532
- Mathews, M., & Zainuddin, S. (2021). *Commentary: Worries over rising COVID-19 cases are fuelling racially charged comments*. Channel News Asia. <https://www.channelnewsasia.com/news/commentary/covid-19-racist-remarks-racially-charged-xenophobia-14718848>
- Menzies, R. E., & Dar-Nimrod, I. (2017). Death anxiety and its relationship with obsessive-compulsive disorder. *Journal of Abnormal Psychology, 126*(4), 367–377. <https://doi.org/10.1037/abn0000263>
- Menzies, R. E., Sharpe, L., & Dar-Nimrod, I. (2021). The effect of mortality salience on bodily scanning behaviors in anxiety-related disorders. *Journal of Abnormal Psychology, 130*(2), 141–151. <https://doi.org/10.1037/abn0000577>
- Ministry of Trade and Industry (2020). *Impact of the COVID-19 pandemic on the Singapore economy*. Ministry of Trade and Industry. <https://www.mti.gov.sg/Resources/feature-articles/2020/Impact-of-the-COVID-19-Pandemic-on-the-Singapore-Economy>
- Nail, P. R., & McGregor, I. (2009). Conservative shift among liberals and conservatives following 9/11/01. *Social Justice Research, 22*(2–3), 231–240. <https://doi.org/10.1007/s11211-009-0098-z>
- Pyszczynski, T., Greenberg, J., & Solomon, S. (1999). A dual-process model of defense against conscious and unconscious death-related thoughts: An extension of terror management theory. *Psychological Review, 106*(4), 835–845. <https://doi.org/10.1037/0033-295X.106.4.835>

- Pyszczynski, T., Lockett, M., Greenberg, J., & Solomon, S. (2021). Terror management theory and the COVID-19 pandemic. *Journal of Humanistic Psychology, 61*(2), 173–189. <https://doi.org/10.1177/0022167820959488>
- Pyszczynski, T., Solomon, S., & Greenberg, J. (2015). Chapter one-thirty years of terror management theory: From genesis to revelation. In J. M. Olson & M. P. Zanna (Eds.) *Advances in experimental social psychology, 52*, pp. 1–70. Academic Press. <https://doi.org/10.1016/bs.aesp.2015.03.001>
- Pyszczynski, T., Wicklund, R. A., Florescu, S., Koch, H., Gauch, G., Solomon, S., & Greenberg, J. (1996). Whistling in the dark: Exaggerated consensus estimates in response to incidental reminders of mortality. *Psychological Science, 7*(6), 332–336. JSTOR. <https://doi.org/10.1111/j.1467-9280.1996.tb00384.x>
- Schimmel, J., Simon, L., Greenberg, J., Pyszczynski, T., Solomon, S., Waxmonsky, J., & Arndt, J. (1999). Stereotypes and terror management: Evidence that mortality salience enhances stereotypic thinking and preferences. *Journal of Personality and Social Psychology, 77*(5), 905–926. <https://doi.org/10.1037/0022-3514.77.5.905>
- Sheeran, P., & Webb, T. L. (2016). The intention–behavior gap. *Social and Personality Psychology Compass, 10*(9), 503–518. <https://doi.org/10.1111/spc3.12265>
- Solomon, S., Greenberg, J., & Pyszczynski, T. (1991). A terror management theory of social behavior: The psychological functions of self-esteem and cultural worldviews. In M. P. Zanna (Ed.) *Advances in experimental social psychology, 24*, pp. 93–159. Academic Press. [https://doi.org/10.1016/S0065-2601\(08\)60328-7](https://doi.org/10.1016/S0065-2601(08)60328-7)
- StatCounter. (2021, May 24). *Search engine market share Singapore*. StatCounter Global Stats. <https://gs.statcounter.com/search-engine-market-share/all/singapore/>
- Stein, J. H., Steinley, D., & Cropanzano, R. (2011). How and why terrorism corrupts the consistency principle of organizational justice. *Journal of Organizational Behavior, 32*(7), 984–1007. JSTOR. <https://doi.org/10.1002/job.729>
- Strachan, E., Schimmel, J., Arndt, J., Williams, T., Solomon, S., Pyszczynski, T., & Greenberg, J. (2007). Terror mismanagement: Evidence that mortality salience exacerbates phobic and compulsive behaviors. *Personality and Social Psychology Bulletin, 33*(8), 1137–1151. <https://doi.org/10.1177/0146167207303018>
- The Straits Times (2021). *Care groups see spike in mental health crises in Singapore amid heightened alert curbs*. <https://www.straitstimes.com/singapore/health/care-groups-see-spike-in-mental-health-crises-in-singapore-amid-heightened-alert>
- The World Bank (2019). *Individuals using the Internet (% of population)—Singapore*. The World Bank. <https://data.worldbank.org/indicator/IT.NET.USER.ZS?locations=SG>
- Top Ten (2019). *TOP 10 luxury Brands in Singapore*. TOP 10 presenting the world to you, from top to ten! <http://topten.sg/shopping/901>
- Tseng, Q. (2019, November 27). Reconstruct google trends daily data for extended period. *Towards data science*. <https://towardsdatascience.com/reconstruct-google-trends-daily-data-for-extended-period-75b6ca1d3420>
- Webster, R. J., & Saucier, D. A. (2011). The effects of death reminders on sex differences in prejudice toward gay men and lesbians. *Journal of Homosexuality, 58*(3), 402–426. <https://doi.org/10.1080/00918369.2011.546735>

- Yen, C.-L., & Cheng, C.-P. (2010). Terror management among Taiwanese: Worldview defence or resigning to fate? *Asian Journal of Social Psychology*, *13*(3), 185–194. <https://doi.org/10.1111/j.1467-839X.2010.01328.x>
- Zaleskiewicz, T., Gasiorowska, A., Kesebir, P., Luszczynska, A., & Pyszczynski, T. (2013). Money and the fear of death: The symbolic power of money as an existential anxiety buffer. *Journal of Economic Psychology*, *36*, 55–67. <https://doi.org/10.1016/j.joep.2013.02.008>