

Understanding pandemic behaviours in Singapore – Application of the Terror Management Health Model

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Abstract

The novel coronavirus, now known as COVID-19, was first reported in China in December 2019 and became a global crisis by March 2020. Both adaptive and maladaptive behaviours were observed in response to aspects of the crisis, some of which appeared to be contradictory to coping and curbing the threat of COVID-19. For instance, the purchase and use of surgical masks and sanitisers could be understood as logical health-oriented behaviours relevant to coping with the COVID-19 pandemic. The breaching of social distancing measures and forwarding unverified news, however, might have done more harm than good. In applying the proximal and distal defences proposed within the Terror Management Health Model (TMHM), this article suggests explanations for these behaviours as individuals' attempts to alleviate anxiety arising from reminders of their mortality. Information from local newspapers and media is used to highlight and identify common behaviours observed in the pandemic, and the TMHM is applied to explain these behaviours. This paper briefly concludes with a call for empirical validation of the TMHM for the behaviours observed in relation to COVID-19, and for the use of TMHM conceptualisations to develop countermeasures to reduce maladaptive behaviours in the current, and future, pandemics in Singapore.

Keywords: TMHM, COVID-19, health behaviours, Singapore, empirical validation

The first cluster of the novel coronavirus was reported in Wuhan, China, in December 2019. By March 2021, this coronavirus, now known as COVID-19, had escalated to a global pandemic, infecting more than 110 million and killing 2.5 million worldwide (Johns Hopkins University Centre for Systems Science and Engineering, n.d.). Based on the Pandemic Influenza Severity Assessment (PISA), edited by the World Health Organisation (2017), COVID-19 is a severe pandemic based on its transmissibility, symptom severity, and economic impact. This paper aims to explain behaviours observed in Singapore during the COVID-19 pandemic by applying the Terror Management Health Model (TMHM; Arndt & Goldenberg, 2017) to understand individual differences in responding to this prolonged crisis. This paper also hopes to encourage empirical research that applies TMHM to the behaviours observed during COVID-19 in Singapore. These findings can potentially feed back into strategies and policies to support the Singaporean community in continuing to cope in an evidence-based manner, both during these difficult times and in preparation for the next pandemic.

Terror Management Theory

Terror Management Theory (TMT) was first developed by Greenberg, Pyszczynski, and Solomon (1986) by applying an existential perspective in understanding variants of social behaviours. Philosophical knowledge and feedback from in vivo observations and experimental data have contributed to the evolution of the theory and its current definition. Essentially, TMT posits that humans, being born with advanced cognitive capabilities, recognise that their lives are finite. This recognition that our mortality is limited triggers death thoughts which conflict with our need for self-preservation, thereby inducing anxiety. Individuals would then alleviate this anxiety by extending their mortality in a literal or symbolic manner, represented by attempts to avoid or minimise threats, defend worldviews, enhance self-esteem, and seek close relationships (Plusnin et al., 2018).

The worldview defence and self-esteem pathways in reducing death thoughts following reminders of death have been widely researched and established in both

Asian and non-Asian cultures (Heine et al., 2002). Multiple studies have shown that after being reminded about death, individuals are more likely to defend their worldview by reporting less favourable opinions of those who represent or uphold a different worldview to themselves (Halloran & Kashima, 2004), as well as providing fewer resources (Tam et al., 2007), or meting out harsher punishment (Rosenblatt et al., 1989). People are also more likely to behave and make decisions that would bolster their self-esteem after reminders of death, for example by purchasing items reflective of higher status (Heine et al., 2002) or reporting higher positive regard from significant others (Cox & Arndt, 2012). Seeking close relationships has also been found to alleviate death thoughts following mortality salience. As summarised by Plusnin and colleagues (2018), individuals were more likely to initiate social contact (Taubman-Ben-Ari et al., 2002), seek out sexual intimacy (Birnbaum et al., 2011), and show more commitment to romantic relationships (Florian et al., 2002) after being reminded of their inevitable deaths.

Proximal and Distal Defences

From the perspective of TMT, individuals are likely to take actions and decisions to extend their mortality in a literal or symbolic manner after being reminded of their deaths. These actions and decisions may or may not be logical and relevant to the threats at hand. The determination of particular actions or decisions is based on the prominence of death thoughts in the individuals' focal attention, giving rise to the dual process model in TMT (Pyszczynski et al., 1999).

The dual process model suggests that if death thoughts are prominent in the individual's awareness, those individuals are more likely to engage in *proximal* defences. When individuals apply these defences, they are more likely to take actions seen as rational and relevant to the threats at hand, thereby regulating the triggered anxiety. These actions and decisions can be health-oriented responses that reduce the perceived threat by promoting good health, or threat-avoidant responses which deny vulnerability to or distract from life threatening conditions. However, as death thoughts recede into the background or linger at the periphery of consciousness after a delay, individuals will adopt *distal* defences. Distal defences are actions and decisions that may appear illogical and contradictory to the current threats but are consistent with the individuals' worldview, self-esteem, or relational needs (Kosloff et al., 2019). Pyszczynski et al. (1999) and Kosloff et al. (2019) provide

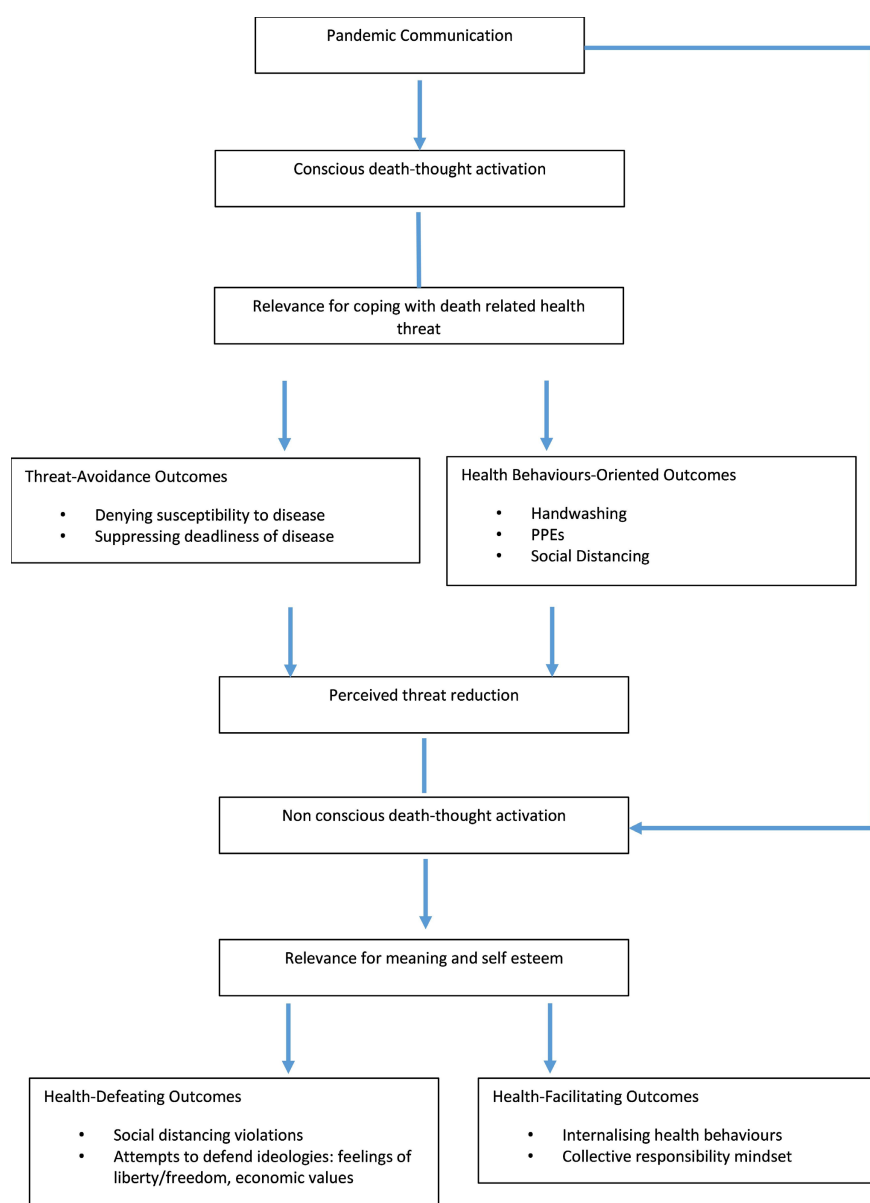
comprehensive evidence and discussions on the dual process model and its role in TMT.

This dual process system of TMT was later applied to health behaviours (Arndt & Goldenberg, 2017), giving rise to the Terror Management Health Model (TMHM). A classic example to introduce the dual process model and the TMHM is the series of studies conducted by Routledge et al. (2004). The researchers applied TMHM to attitudes towards suntanning and sun protection. In their studies, they recruited female participants who valued being tanned and divided them into two groups. One group wrote about their deaths while the other wrote about dental pain (control condition). These groups were further divided into two, where half of each group was asked to indicate interest in purchasing sunscreens with a different sun protective factor (SPF) immediately after writing about their death or dental pain, or to indicate their preference after a time delay. Logically, when reminded of one's death, we would expect individuals to make rational decisions such as expressing more interest in sunscreens with better protective properties (i.e., higher SPF) regardless of the delay between the mortality salience induction and their interest in sun protection. As predicted, individuals in the mortality salience non-delay group did indicate significantly higher interest in sunscreens with higher SPF (i.e., proximal defence). However, those in the mortality salience delay condition did not show such a preference. This difference in interest in sunscreen products was not apparent in the dental pain control condition. This pattern of results suggests that individuals who valued being tanned adopted the distal defence by expressing significantly less interest in sunscreen products, as death thoughts recede into the background after a time delay. This discrepancy in attitude towards health decisions illustrated the dual process model of TMT in the TMHM, where individuals tend to adopt rational health-oriented responses immediately after death thoughts are triggered but this effect changes when there is a time delay between death reminders and responses. Instead, when death thoughts faded after a time delay, individuals are more likely to respond in ways consistent with their self-esteem, in this case being tanned, which seemed to contradict positive health outcomes.

Similarly, McCabe et al. (2014) demonstrated that individuals were more willing to pay more for bottled water and drank more water endorsed by medical doctors immediately after being reminded of their deaths while those who responded after a time delay preferred celebrity-endorsed bottled water. This suggested a

differentiation of proximal and distal defences within the TMHM, where individuals were more likely to adopt health-oriented behaviours immediately after mortality salience cues. In this case, individuals purchase or use products advocated by medical professionals after being reminded about their deaths, which implies direct positive impacts on their health. However, after a time delay they would make choices which enhance self-esteem such as demonstrating a preference for celebrity-endorsed products which make them look and feel good. These results have been replicated with other health behaviours such as exercise (Morris et al., 2019) and sexual behaviours (Bessarabova & Massey, 2020).

Figure 1
Terror Management Health Model in a Pandemic



Note. Reproduced with permission from Courtney et al. (2020).

More recently, Courtney et al. (2020) published a concept paper on the application of the TMHM to attitudes and behaviours observed during the COVID-19 pandemic (Figure 1). Shortly after, Pyszczynski et al. (2020) also published on the application of the dual process model in TMT to understand pandemic-related behaviours and attitudes in the United States (U.S.). These concept papers addressed motivations and meanings of the attitudes and behaviours including minimising COVID-19 earlier on in the pandemic, blaming the Chinese for the virus, and breaching social distancing measures.

Before turning to examine how the TMHM is applied to attitudes and behaviours observed in the COVID-19 pandemic in Singapore, it is important to note that while proximal and distal defences can be easily distinguished in experimental settings, this differentiation can be tricky in the real world. Firstly, the time delay before distal defences are triggered has not been quantified. Although Burke et al. (2010) have found that, experimentally, distal defences could be triggered with delays between 2 to 20 minutes (see also Cox et al., 2019), the time lapse is likely to be significantly longer between mortality salience and decision making and actions in the real world. Furthermore, one cannot control the exposure to other mortality threats following the initial exposure to death threats, especially with a long delay between initial exposure and eventual behavioural outcomes or decision making, thereby complicating the process of differentiating proximal and distal defences. As a start, this paper attempts to overcome these challenges by examining the underlying motivations for these behaviours and decisions, based on the Terror Management Health Model in a pandemic.

Applying Terror Management Theory During COVID-19 in Singapore

Singapore reported its first confirmed COVID-19 case of a 66-year-old Chinese national on the 23rd of January 2020. Subsequently, the country experienced the first COVID-19 deaths

of a 75-year-old Singaporean woman and a 64-year-old Indonesian man on the 21st of March 2020 (Yong, 2021). As the pandemic evolved, the Singapore government started mandating individuals to wear masks and implemented the drastic month-long lockdown, known as the “Circuit Breaker”, on the 7th of April 2020 (Goh, 2020b). The country also saw a spike in cases in April 2020, with more than 1,000 new cases in a single day. Cases tapered to less than 20 a day by December 2020. At the time of publication (December 2022), 1,700 COVID-related deaths have been documented, and mass vaccination has been completed, with over 90% of the Singapore population having received the full vaccination regime (Hirschmann, 2022).

Since December 2019, there has been daily news on COVID-19, covering the nature of the virus, transmission, and lethality, as well as government policies related to the pandemic. Daily, individuals in Singapore were inundated with information on COVID-19 via newsfeeds and social media. Thus, COVID-19 and its death threat have been constantly in individuals’ awareness. With the popularity of the Internet and social media in the digital era, individuals have had access to news on how COVID-19 has affected other countries and their daily death counts. Consequently, the Singaporean community was immersed in the threat of COVID-19, and the knowledge that it has killed many globally has created an association with death.

Proximal Defence

The knowledge that there had been local deaths in Singapore likely heightened the threat of COVID-19 for those living there. From the TMT perspective, the threat of COVID-19 on our mortality is in the spotlight of awareness. This then triggers proximal defences, which serve to alleviate anxiety through both health-oriented behaviours and threat avoidance behaviours to create a sense of safety from COVID-19.

Health-oriented behaviours. A health-oriented behaviour proximal defence was demonstrated by the creation of two petitions on Change.org 2 days after the announcement of the first COVID-19 case in Singapore, to urge the government to ban travellers from China entering Singapore, in an attempt to protect the community from being exposed to potential virus hosts (Kim, 2020). There was also an increase in the number of people wearing surgical masks in public. This was despite earlier government statements to wear masks only for those who exhibited flu-like symptoms (Goh, 2020a; Singapore Government, 2020). The demand

for face masks and sanitisers rose sharply a day after the first confirmed case of COVID-19 was announced, resulting in a heavy shortage of surgical masks within Singapore (Abu Baker, 2020). Many flocked to the pharmacies and supermarkets to purchase multiple boxes of surgical masks, sanitisers, and antibacterial wet wipes to protect themselves from the virus. There was also significantly more traffic in shops where these items were sold, as people lingered in the hope that stocks would be replenished, and long queues were observed where face masks and sanitisers were in supply. These behaviours appear to reflect attempts to reduce death anxiety by having access to and wearing personal protective equipment.

As shortages occurred with sanitisers and face masks, individuals focused their attention on vitamin C supplements (Koe, 2020), presumably hoping to assuage their anxiety related to the COVID-19. Even though experts clarified that there was limited to no evidence regarding the protective strength of supplements such as vitamin C against COVID-19 (Ansorge, 2020; Cheng, 2020), demand for vitamin C increased five times over 2 weeks as the Singapore government escalated the risk level of COVID-19 (Koe, 2020). Some individuals coped by minimising expert opinions and scientific data on the efficacy of vitamin C as a protective measure against COVID-19 and continued to purchase this item as a way to keep themselves safe from COVID-19. This overestimation of the efficacy of vitamin C, and purchase of vitamin C, possibly helped them restore some sense of safety from the death threat posed by COVID-19.

Proximal defence was also apparent in individual choices towards vaccinations. From early 2021 (Ang, 2020), the Singapore government planned a vaccination schedule, aiming to inoculate the population by the third quarter of 2021 (Lai, 2021). According to two studies, the take up rate for vaccinations, if proven safe and effective, was expected to be between 48% (Teo, 2020) to 67.9% (Lazarus et al., 2021). The most common motivation for taking up the vaccine was protection from COVID-19, which directly facilitates health outcomes. However, there was a significant portion of the Singaporean population preferring to delay or decline the vaccination. They cited worries about the safety of the vaccination or uncertainties about the effectiveness of the vaccines (Teo, 2020). Given that unsafe and ineffective vaccinations would predispose them to severe or fatal side effects, as well as not reducing their risk of contracting COVID-19, these decisions to delay or decline the COVID-19 vaccines may

represent proximal defences that serve to allay anxiety from impending death.

Threat avoidance behaviours. Stockpiling could be construed as a threat avoidance behaviour. When the Singapore government announced a lockdown starting from the 7th of April 2020, the country went into a frenzy and started panic buying. Long queues and empty shelves were common sights in grocery stores and supermarkets, and major supermarket chains had to put a limit on the quantity that could be purchased for certain commodities. Apart from herd instincts (Yap & Chen, 2020) and scarcity heuristics (Norberg & Rucker, 2020), findings elucidated in M. Khan's study (2020) which are in line with TMHM could also account for stockpiling behaviours. M. Khan (2020) found a relationship between threat perception of COVID-19 and attitudes towards stockpiling. Specifically, Bangladeshis who perceived COVID-19 as more dangerous to their lives were more likely to endorse purchasing and reserving food. Similarly, Singaporeans' anxiety was likely raised when the government implemented the lockdown in April, as it implied an escalation of risk and threat of the COVID-19 situation. This would have likely increased fear in the Singapore community regarding their health and mortality, thus motivating them to engage in panic buying so that they could minimise the need to go out and therefore avoid exposure to the virus.

As Singapore slowly emerged from the lockdown period, many were still cautious about being outdoors and visiting crowded places such as shopping malls; the proportion of the Singapore community avoiding crowded places increased from 44% to 69% between February 2020 to January 2021 (Hirschmann, 2021a). Upward trends were observed after high numbers of new COVID-19 cases were reported and as of January 2021, 23% of those who participated in the survey expressed that they would avoid returning to work during the COVID-19 outbreak, up from 11% in February 2020 (Hirschmann, 2021b). Apart from the economic repercussions of COVID-19 (e.g., retrenchment) and potential recession (Heng, 2020), some individuals continued to express worries about being exposed to COVID-19 and preferred to stay home to keep themselves safe (Kok & Yip, 2020; Tee, 2020).

Distal Defences

As COVID-19 continues to exist in the public conscience and remind people of the finite nature of their lives, individuals will likely continue to alleviate their anxiety by finding ways to extend their mortality in symbolic

ways. As the distal defence pathway in TMHM proposes, when death thoughts fade into the background but are still accessible, individuals will respond in ways that are consistent with seeking close relationships, reinstating values and worldview, and bolstering self-esteem (Plusnin et al., 2018).

Seeking close relationships. As summarised by Teo and Tan (2020), several individuals had breached quarantine measures to meet loved ones or seek sexual intimacy. These behaviours are consistent with research examining mortality salience and intimate relationships (Birnbaum et al, 2011; Florian et al., 2002). In a series of studies, Birnbaum et al. (2011) found that, regardless of gender, individuals expressed more desire for romantic sex when reminded of their mortality. From the terror management perspective, Singaporeans could be coping with their heightened anxiety by seeking close relationships and sexual intimacy during the lockdown (Lam, 2020b; Tang, 2020) and when serving quarantine orders (Alkhatib, 2021; Tang, 2020).

Indeed, there were more than 360 breaches of quarantine measures, known as stay-home-notices (SHN), in Singapore between the beginning of the COVID-19 pandemic and February 2021 (Ang, 2021). While some of these breaches were clearly a result of mischiefs and irresponsibility (Lam, 2020a, 2020b), some people breached quarantine measures to seek out meaningful and intimate relationships to reduce loneliness, possibly alleviating anxiety triggered by mortality salience (Plusnin et al., 2018). Being placed in quarantine implied a risk of contracting COVID-19 as individuals were deemed to have had a reasonable chance of exposure to the COVID-19 virus. This would likely heighten death thoughts, which could then be amplified by the daily reports of infection numbers and death rates in Singapore and other countries. In the context of TMT, it is understandable for some of these individuals to breach social distancing measures and SHN, such as a British man breaching SHN to meet with his fiancée in the hotel in which he was quarantined (Alkhatib, 2021). Such quarantine breaches to seek out close relationships offer an anxiety buffer from mortality salience prompted by COVID-19, particularly as the 14 days of quarantine wore on and the death thoughts receded from awareness.

Besides seeking contact with close and loved ones, the sharing of unverified COVID-19 information with family and friends can be construed as a type of anxiety buffering measure when faced with mortality salience. The sharing of information, even before official

verification, could be a means to stay connected with loved ones. At the same time, it also possibly served as an attempt to extend symbolic mortality as sharing information in crisis could enhance survival of other in-group members.

Worldview and self-esteem. One way through which individuals protect in-group members appears to be the sharing of information in crisis, even before its verification. Misinformation related to COVID-19 circulated in the community from February to April 2020 (Ministry of Communications and Information, 2020a). This information was related to the nature of the COVID-19 virus, government guidelines on public service provision and utilisation, and social distancing measures. This is in line with the findings reported in studies by the National Centre of Infectious Diseases (NCID), Wee Kim Wee School of Communication and Information of the Nanyang Technological University, and the Saw Swee Hock School of Public Health of National University of Singapore, which examined the Singapore community's knowledge, perception, and behaviour during the COVID-19 pandemic (Chew, 2020).

These studies found a significant amount of unverified information circulating on messaging and social media platforms and reported that as many as 78% of their respondents forwarded information on messaging platforms to family and friends. Out of this 78% of respondents, about 14% would circulate information received on messaging platforms before verification (Oh, 2020). Individuals who tended to forward information on social media were more likely to endorse panic buying, suggesting that forwarding information and panic behaviours during pandemics serve common functions when death thoughts are accessible in individuals' minds. Such circulation of information, regardless of the authenticity of the information, is consistent with a symbolic extension of individuals' mortality by ensuring the survival of family and friends through information sharing. Such information sharing can be seen as providing family and friends with the ability to enact timely actions for self-preservation.

Besides bias towards in-group members, there has been a rise in negative attitudes among Singaporeans towards certain groups of non-Singaporeans. There has been an intensification of xenophobic sentiments as exemplified by a commentary published in the national Chinese newspaper scapegoating foreign workers for the ongoing pandemic in Singapore, attributing the high number of cases to their lack of personal hygiene (Mahmud, 2020). Singaporeans also criticised expatriates who

congregated and flouted social distance measures as being "selfish" and called for the government not to apply "double standards" towards these expats (Tai, 2020). Anger was also directed at Indian nationals for pandemic-induced job losses suffered by Singaporeans (A. Khan, 2020).

Apart from the intensifying ingroup-outgroup split, another example of how individuals regulated their anxiety arising from mortality salience from COVID-19 was demonstrated by Paramjeet Kaur. As was widely covered by the media, Paramjeet Kaur expressed and upheld strong beliefs that she is "we the people" and "sovereign" (Alkhatib, 2020). While upholding her worldview as a "sovereign", Kaur violated the COVID-19 rules of Singapore and adopted health-defeating behaviours including not wearing a mask on at least two occasions in public areas and eating at a food stall during the lockdown, when individuals were banned from eating outside of their homes (Alkhatib, 2020). Her behaviour possibly illustrated a distal defence, in which she upheld her worldview to regulate her anxiety arising from mortality salience even though this led her to adopt health-defeating behaviours.

Distal defences can also be adaptive and selfless. As the country coped with and adjusted to COVID-19, the Singaporean community also exhibited prosocial behaviours. The collective spirit, where looking out for each other and family orientation are important, is still common in the Singapore community even though the country is multicultural (Hofstede Insights, 2020).

With death thoughts likely prevalent in the Singaporean community during the COVID-19 pandemic, individuals showed kindness during the difficult times. As face masks and sanitisers ran out, there was news about and praise for kind and generous individuals who placed bottles of sanitisers and face masks in lifts for public consumption (Lee, 2020; Wong, 2020). Others decided to donate their personal pay-out from the Singapore government (the Solidarity Payment¹) to non-profit organisations and started campaigns encouraging others to donate their Solidarity Payment to charities to help those whose livelihoods were affected by COVID-19 (Yuen, 2020). Some set up online platforms for people to share resources such as face masks (Wong, 2020), while others dedicated efforts to help low-income families by providing food and sewing and donating reusable face masks (Ministry of Communications and Information, 2020b;

1 Solidarity Payment is a one-off sum of SGD\$600 given to all Singapore citizens aged 21 years and above to alleviate the impact of the COVID-19 pandemic..

Toh, 2020), demonstrating social responsibility to keep the community, which represents part of our collective mortality, safe. The empathy and generosity of these behaviours represent important values and worldviews; behaving in ways consistent with these values improves sense of self and reinforces self-esteem. Such altruistic behaviours as seen in Singapore in the early stages of the pandemic fit with the proposed mechanisms of TMHM to reduce anxiety from mortality salience.

Conclusion: Reflecting on a Terror Management Health Perspective of COVID-19 in Singapore

As reviewed in this paper, the TMHM can facilitate our understanding of health behaviours observed in Singapore during the COVID-19 pandemic, particularly in the early stages. While behaviours such as stockpiling, forwarding unverified news, and breaching of social distancing measures and quarantine orders occurred, kindness and generosity were also seen as individuals behaved in ways that were consistent with their worldviews. These behaviours are consistent with the TMHM, where they serve as proximal and distal defences against the anxiety triggered by death thoughts.

Nevertheless, one may question the generalisability of the TMHM as not everyone who is exposed to similar levels of COVID-19 risk responded in the same way. Hayes et al. (2010) provide an explanation to address this discrepancy. Their review highlights that other personal variables could have influenced individual responses following death reminders. For instance, individuals who were psychologically stable, religious, or reported a secure attachment style were less likely to defend their worldviews when reminded of their mortality, despite reporting an increase in death thoughts (Hayes et al., 2010). Also, as highlighted earlier in this discussion, the differentiation of proximal and distal defences is challenging in the real world as it is not possible to control one's exposure to other mortality threats following the initial exposure but before behavioural outcomes or decision making are assessed. Hence, we have focused on examining the underlying motivations for these behaviours and decisions in an attempt to overcome this challenge of clearly demarcating proximal and distal defences.

Understanding the types of behaviours discussed here from the TMHM perspective would allow for anticipation and planning for countermeasures. For instance, if the intent of forwarding unverified news is to symbolically extend mortality by ensuring the survival of the in-group, it could be highlighted how forwarding

authentic official news can promote self-preservation. Similarly, public messaging could also appeal to the social responsibility and altruistic spirit of the collective Singapore community to regulate panic behaviours and encourage adherence to social distancing and quarantine measures. Considerations could also be made to allow safe face-to-face meetings during quarantine measures so that individuals can turn to close relationships to cope with the anxiety arising from mortality salience but in a controlled way which does not increase risk.

The TMHM offers a novel perspective to make sense of individual behaviours in a pandemic. Nevertheless, these are only observations and have not been rigorously and empirically studied in the Singapore context. This paper therefore serves as a starting point to encourage research into studying and validating the TMHM in a pandemic in Singapore. With new scientific evidence and understanding, Singapore will be able to cope with the next pandemic in a more evidence-based and effective manner.

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References

- Abu Baker, J. (2020, January 24). *N95, surgical MASKS run out at retail outlets; MOH assures public there is enough stock*. CNA. www.channelnewsasia.com/news/singapore/wuhan-virus-n95-surgical-masks-run-out-at-retail-outlets-12323040
- Alkhatib, S. (2020, May 19). *'Sovereign' woman accused of failing to wear mask in public faces two additional charges*. The Straits Times. www.straitstimes.com/singapore/courts-crime/sovereign-woman-accused-of-failing-to-wear-mask-in-public-faces-two
- Alkhatib, S. (2021, February 15). *British man breached SHN to meet fiancée; couple plead guilty*. The Straits Times. www.straitstimes.com/singapore/courts-crime/british-man-breached-shn-to-meet-fiancee-couple-plead-guilty
- Ang, H. M. (2020, December 30). *NCID nurse becomes first person in Singapore to receive COVID-19 vaccine*. CNA. www.channelnewsasia.com/news/singapore/covid-19-first-vaccinations-ncid-healthcare-workers-pfizer-13864346
- Ang, H. M. (2021, February 2). *More than 360 COVID-19 stay-home notice breaches and 130 quarantine order violations so far: MHA*. CNA. www.channelnewsasia.com/news/singapore/covid-19-shn-quarantine-order-breach-crime-mha-14094458
- Ansonge, R. (2020, December 12). *The effectiveness of vitamins C and D against COVID-19*. UHealth Today. www.uhealth.org/today/effectiveness-of-vitamins-c-and-d-against-covid-19/

- Arndt, J., & Goldenberg, J. L. (2017). Where health and death intersect: Insights from a terror management health model. *Current Directions in Psychological Science*, 26(2), 126-131. <https://doi.org/10.1177/0963721416689563>
- Bessarabova, E., & Massey, Z. B. (2020). Testing terror management health model and integrating its predictions with the theory of psychological reactance. *Communication Monographs*, 87(1), 25-46. <https://doi.org/10.1080/03637751.2019.1626992>
- Birnbaum, G., Hirschberger, G., & Goldenberg, J. (2011). Desire in the face of death: Terror management, attachment, and sexual motivation. *Personal Relationships*, 18(1), 1-19. <https://doi.org/10.1111/j.1475-6811.2010.01298.x>
- 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>
- Cheng, R. Z. (2020). Can early and high intravenous dose of vitamin C prevent and treat coronavirus disease 2019 (COVID-19)? *Medicine in Drug Discovery*, 5, 100028. <https://doi.org/10.1016%2Fj.medidd.2020.100028>
- Chew, H. M. (2020, May 21). *6 in 10 people in Singapore have received fake COVID-19 news, likely on social media: Survey*. CNA. www.channelnewsasia.com/news/singapore/fake-covid-19-news-study-ncid-messaging-platforms-whatsapp-12756084.
- 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%2Fbjso.12392>
- Cox, C. R., & Arndt, J. (2012). How sweet it is to be loved by you: The role of perceived regard in the terror management of close relationships. *Journal of Personality and Social Psychology*, 102(3), 616-632. <https://doi.org/10.1037/a0025947>
- Cox, C. R., Darrell, A., & Arrowood, R. B. (2019). The method behind the science: A guide to conducting terror management theory research. In C. Routledge & M. Vess (Eds.), *Handbook of terror management theory* (pp. 85-132). Academic Press. <https://doi.org/10.1016/B978-0-12-811844-3.00025-1>
- Florian, V., Mikulincer, M., & Hirschberger, G. (2002). The anxiety-buffering function of close relationships: Evidence that relationship commitment acts as a terror management mechanism. *Journal of Personality and Social Psychology*, 82(4), 527-542. <https://doi.org/10.1037/0022-3514.82.4.527>
- Goh, T. (2020a, February 3). *Wuhan virus: Masks should be used only by those who are unwell*. The Straits Times. www.straitstimes.com/singapore/health/masks-should-be-used-only-by-those-who-are-unwell.
- Goh, T. (2020b, July 26). *Six months of Covid-19 in Singapore: A timeline*. The Straits Times. www.straitstimes.com/singapore/six-months-of-covid-19-in-singapore-a-timeline.
- Greenberg, J., Pyszczynski, T., & Solomon, S. (1986). The causes and consequences of a need for self-esteem: A terror management theory. In R. E. Baumeister (Ed.), *Public self and private self* (pp. 189-212). Springer. <https://doi.org/10.1007/978-1-4613-9564-5>
- Halloran, M. J., & Kashima, E. S. (2004). Social identity and worldview validation: The effects of ingroup identity primes and mortality salience on value endorsement. *Personality and Social Psychology Bulletin*, 30(7), 915-925.
- Hayes, J., Schimel, J., Arndt, J., & Faucher, E. H. (2010). A theoretical and empirical review of the death-thought accessibility concept in terror management research. *Psychological Bulletin*, 136(5), 699-739. <https://doi.org/10.1037/a0020524>
- 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>
- Heng, M. (2020, July 9). *Shopper traffic stabilises 3 weeks into phase two of Singapore's reopening, but many spend cautiously*. The Straits Times. www.straitstimes.com/singapore/shopper-traffic-stabilises-but-many-spend-cautiously-due-to-economic-uncertainty.
- Hirschmann, R. (2021a). *Singapore: COVID-19 avoiding public places 2021*. Statista. www.statista.com/statistics/1110181/singapore-avoiding-public-places-during-covid-19-outbreak/#statisticContainer.
- Hirschmann, R. (2021b). *Singapore: COVID-19 avoiding workplaces 2021*. Statista. www.statista.com/statistics/1110183/singapore-avoiding-going-to-work-during-covid-19-outbreak/
- Hirschmann, R. (2022). *Singapore: Covid-19 vaccination rate 2022*. Statista. www.statista.com/statistics/1223524/singapore-covid-19-vaccines-administered/
- Hofstede Insights. (2020, August 12). *Country comparison*. www.hofstede-insights.com/country-comparison/singapore/.
- Johns Hopkins University Center for Systems Science and Engineering (n.d.). *COVID-19 Content Portal*. JHU CSSE. <https://systems.jhu.edu/research/public-health/ncov/>
- Khan, A. U. (2020, October 8). *Why have Singaporeans turned against Indian professionals?* The Diplomat. <https://thediplomat.com/2020/10/why-have-singaporeans-turned-against-indian-professionals/>.
- Khan, M. N. A. (2020). Intention to reserve food during COVID-19 pandemic among Bangladeshi Internet users: Based on Theory of Planned Behaviour. *European Journal of Medical and Educational Technologies*, 13(2), em2010. <https://doi.org/10.30935/ejmet/8299>
- Kim, S. (2020, Jan 26). *Ban travellers from China entering Singapore!* Change.org. www.change.org/p/lee-hsien-loong-ban-travellers-from-china-entering-singapore
- Koe, T. (2020, February 26). *Coronavirus in Singapore: Vitamin demand jumps five-fold in two weeks for supermarket chain*. nutraingredients. www.nutraingredients-asia.com/Article/2020/02/26/Coronavirus-in-Singapore-Vitamin-demand-jumps-five-fold-in-two-weeks-for-supermarket-chain
- Kok, Y., & Yip, W. Y. (2020, June 2). *Roads and trains get more crowded as people return to school and work after circuit breaker*. The Straits Times. www.straitstimes.com/singapore/roads-and-trains-get-more-crowded-as-people-return-to-school-and-work-after-circuit.
- Kosloff, S., Anderson, G., Nottbohm, A., & Hoshiko, B. (2019). Proximal and distal terror management defences: A systematic review and analysis. In C. Routledge & M. Vess (Eds.), *Handbook of terror management theory* (pp. 31-63). Academic Press. <https://doi.org/10.1016/B978-0-12-811844-3.00025-1>
- Lai, L. (2021, February 1). *Singapore will have capacity to get population vaccinated against Covid-19 by Q3 2021, but may take longer to do so*. The Straits Times. www.straitstimes.com/singapore/politics/singapore-will-have-capacity-to-get-population-vaccinated-against-covid-19-by-q3.

- Lam, L. (2020a, April 7). *Man charged after having bak kut teh meal at hawker centre while on stay-home notice*. CNA. www.channelnewsasia.com/news/singapore/stay-home-notice-bak-kut-teh-charged-covid-19-coronavirus-12617212.
- Lam, L. (2020b, June 3). *Man jailed for letting woman into hotel room while on stay-home notice, meeting others in basement car park*. CNA. www.channelnewsasia.com/news/singapore/man-jailed-let-woman-hotel-room-stay-home-notice-pan-pacific-12799354.
- Lazarus, J. V., Ratzan, S. C., Palayew, A., Gostin, L. O., Larson, H. J., Rabin, K., Kimball, S., & El-Mohandes, A. (2021). A global survey of potential acceptance of a COVID-19 vaccine. *Nature Medicine*, 27, 225-228. <https://doi.org/10.1038/s41591-020-1124-9>
- Lee, M. (2020, February 4). *'Proud this person is in our block': Residents touched by gesture of neighbour who put masks, sanitisers in lifts*. TODAYonline. www.todayonline.com/singapore/proud-have-person-our-block-residents-touched-gesture-caring-neighbour-who-put-masks.
- Mahmud, A. H. (2020, April 18). *COVID-19: Forum letter on foreign worker dormitory cases reveals 'underlying racism', says Shanmugam*. CNA. www.channelnewsasia.com/news/singapore/covid-19-letter-zaobao-foreign-worker-dormitory-racism-shanmugam-12654924.
- McCabe, S., Vail III, K. E., Arndt, J., & Goldenberg, J. L. (2014). Hails from the crypt: A terror management health model investigation of the effectiveness of health-oriented versus celebrity-oriented endorsements. *Personality and Social Psychology Bulletin*, 40(3), 289-300. <https://doi.org/10.1177/0146167213510745>
- Ministry of Communications and Information. (2020a, April 23). *Clarifications: Misinformation, rumours regarding COVID-19*. www.gov.sg/article/covid-19-clarifications.
- Ministry of Communications and Information. (2020b, July 10). *Siblings sew and donate over 300 masks to the needy*. www.gov.sg/article/siblings-sew-and-donate-over-300-masks-to-the-needy.
- Morris, K. L., Goldenberg, J. L., Arndt, J., & McCabe, S. (2019). The enduring influence of death on health: Insights from the terror management health model. *Self and Identity*, 18(4), 378-404. <https://doi.org/10.1080/15298868.2018.1458644>
- Norberg, M., & Rucker, D. (2020, June 23). *Psychology can explain why coronavirus drives us to panic buy. It also provides tips on how to stop*. <https://theconversation.com/psychology-can-explain-why-coronavirus-drives-us-to-panic-buy-it-also-provides-tips-on-how-to-stop-134032>
- Oh, T. (2020, May 22). *New studies by local researchers explore social impact of Covid-19 outbreak in Singapore*. TODAYonline. www.todayonline.com/singapore/new-studies-local-researchers-explore-social-impact-covid-19-outbreak-singapore.
- Plusnin, N., Pepping, C. A., & Kashima, E. S. (2018). The role of close relationships in terror management: A systematic review and research agenda. *Personality and Social Psychology Review*, 22(4), 307-346. <https://doi.org/10.1177/1088868317753505>
- Pyszczynski, T., Greenberg, J., & Solomon, S. (1999). A dual-process model of defence 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. (2020). Terror management theory and the COVID-19 pandemic. *Journal of Humanistic Psychology*, 61(2), 173-189. <https://doi.org/10.1177/0022167820959488>
- Rosenblatt, A., Greenberg, J., Solomon, S., Pyszczynski, T., & Lyon, D. (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 and Social Psychology*, 57, 681-690. <https://doi.org/10.1037//0022-3514.57.4.681>
- Routledge, C., Arndt, J., & Goldenberg, J. L. (2004). A time to tan: Proximal and distal effects of mortality salience on sun exposure intentions. *Personality and Social Psychology Bulletin*, 30(10), 1347-1358. <https://doi.org/10.1177/0146167204264056>
- Singapore Government. (2020, January 30). *Singapore Government Advisory on Mask Wearing*. Facebook. www.facebook.com/gov.sg/posts/wear-a-mask-only-if-you-are-unwell-you-dont-need-to-wear-a-mask-if-you-are-well/10158039303438686/.
- Tai, J. (2020, May 30). *Racism and xenophobia resurfacing during Covid-19: MCCY minister Grace Fu*. The Straits Times. www.straitstimes.com/singapore/racism-and-xenophobia-resurfacing-during-covid-19-mccy-minister-grace-fu
- Tam, K. P., Chiu, C. Y., & Lau, I. Y. M. (2007). Terror management among Chinese: Worldview defence and intergroup bias in resource allocation. *Asian Journal of Social Psychology*, 10(2), 93-102. <https://doi.org/10.1111/j.1467-839X.2007.00216.x>
- Tang, L. (2020, June 3). *Woman fined for giving sexual services during circuit breaker; jail for man who breached stay-home notice*. TODAYonline. www.todayonline.com/singapore/woman-fined-giving-sexual-services-during-circuit-breaker-jail-man-who-breached-stay-home
- Taubman-Ben-Ari, O. T., Findler, L., & Mikulincer, M. (2002). The effects of mortality salience on relationship strivings and beliefs: The moderating role of attachment style. *The British Journal of Social Psychology*, 41, 419-441. <https://doi.org/10.1348/014466602760344296>
- Tee, K. (2020, July 19). *Commentary: Why I still stay home most days even though circuit breaker has been lifted*. CNA. www.channelnewsasia.com/news/commentary/coronavirus-covid-19-phase-2-singapore-how-safe-go-out-aircon-12940348
- Teo, J. (2020, December 12). *Covid-19 vaccine: Will you take it? 8 in 10 say yes in ST poll*. The Straits Times. www.straitstimes.com/singapore/health/covid-19-vaccine-will-you-take-it-8-in-10-say-yes-in-st-poll.
- Teo, J., & Tan, K. (2020, July 1). *Who's been charged for breaking Covid-19 laws in Singapore & the penalties they faced*. 8 Days. www.8days.sg/seeanddo/thingstodo/whos-been-charged-for-breaking-covid-19-laws-in-singapore-the-12891072.
- Toh, W. L. (2020, April 14). *Nationwide movement to spur S'pore residents to sew masks during Covid-19 circuit breaker period*. The Straits Times. www.straitstimes.com/singapore/nationwide-movement-to-spur-spore-residents-to-sew-masks-during-covid-19-circuit-breaker.
- Wong, Y. (2020, February 24). *Singaporeans going the extra mile to help others amid Covid-19*. The New Paper. www.tnp.sg/news/singapore/singapore-do-gooders-going-extra-mile-amid-covid-19.
- World Health Organization. (2017). *Pandemic influenza severity assessment (PISA): A WHO guide to assess the severity of influenza in seasonal epidemics and pandemics*. <https://apps.who.int/iris/handle/10665/259392>.
- Yap, A. & Chen, C. Y. (2020). *The psychology behind coronavirus panic buying*. <https://knowledge.insead.edu/>

[economics-finance/the-psychology-behind-coronavirus-panic-buying-13451](#)

Yong, M. (2021, February 3). *Timeline: How the COVID-19 outbreak has evolved in Singapore so far*. CNA. www.channelnewsasia.com/news/singapore/singapore-covid-19-outbreak-evolved-coronavirus-deaths-timeline-12639444.

Yuen, S. (2020, April 19). *Coronavirus: Singaporeans donate their Solidarity payouts to charities*. The Straits Times. www.straitstimes.com/singapore/sporeans-donate-their-solidarity-payouts.

