

The urge to search: A multinational model of prepurchase behavior during COVID-19

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How to cite: Wang, T. H. (2023). The urge to search: A multinational model of prepurchase behavior during COVID-19. *Social Behavior and Personality: An international journal*, 51(1), e12062

In this study I proposed a multinational model to explore how COVID-19 mortality salience influences countries' prepurchase online keyword search behavior for products during the pandemic. I used the COVID-19 death toll in 75 countries and extracted Google Trends data to develop a global search ranking that I called the religious searching popularity index (RSPI) as well as a prepurchase index (PPI) for the test products. I used terror management theory to investigate how the RSPI and product type (home use or nonhome use) moderated the relationship between the COVID-19 death toll and the PPI for each of eight products. The results suggested that purchasing did not increase for every home-use product, nor did purchasing of every non-home-use product decrease during the COVID-19 pandemic. According to the PPIs, countries with a higher RSPI had lower search impulses for Nintendo Switch, perfume, treadmills, and watches. The death toll significantly affected the PPIs of some specific home-use and non-home-use items, mainly in countries with lower RSPIs. Replication of this model will assist multinational businesses and researchers in identifying market opportunities for products.

Keywords

COVID-19, Google Trends, mortality salience, consumer behavior, prepurchase behavior, death anxiety, product type, religious searching popularity index, prepurchase index, religiosity

Article Highlights

- Terror management processes from laboratories can be examined in a wider global context.
- COVID-19 mortality salience was found to significantly affect online prepurchase search behavior for both home-use and non-home-use products.
- Religious searching popularity interacted with COVID-19 mortality salience to ease the search impulse on both home-use and non-home-use products.
- Future studies may replicate this model to detect, nowcast, and forecast important influences of events on people's behavioral shifts by applying terror management theory.

Coronavirus 2019 (COVID-19) has caused millions of deaths globally and has aroused mortality salience stimuli (Hu et al., 2020). In the *American Psychological Association Dictionary of Psychology*, the term *mortality salience* is defined as "the awareness of the inevitability of one's death." Mortality salience contains two stages: conscious and nonconscious. Fear of dying from COVID-19 is a conscious stage of feeling direct mortality threat. In this stage, people may use a proximal response strategy, such as denying its death possibility or engaging in protective behaviors (mask wearing, social distancing, staying at home). When mortality salience fades to a nonconscious state, people will then take a consumption shift to reduce the nonconscious mortality salience concern. These *distal defenses* from nonconscious

reaction are seemingly unrelated behavioral responses as coping mechanisms involving consumption shift (Jiménez et al., 2020). Terror management theory researchers present these conscious and unconscious reactions as corresponding ways of defending against COVID-19 mortality salience thoughts (Courtney et al., 2020; Pyszczynski et al., 2021). COVID-19 mortality salience for some people may be at the conscious stage (the fear of dying from COVID-19), and for others may be at the nonconscious stage (Courtney et al., 2020; Pyszczynski et al., 2021).

According to terror management theory, mortality salience, coupled with death anxiety, is a motivating force behind a diverse set of actions designed to defend oneself or one's social group when threatened (VandenBos, 2007). Terror management theory researchers have indicated that people use various forms of consumption behavior to cope with mortality salience fear (Routledge & Vess, 2018) because these consumer-related behaviors can boost self-esteem and help people feel valued in society. Such behaviors include an enhanced desire for conspicuous or entertainment products to justify status and materialism, indulgent food choices to justify body esteem, and giving higher priority to physical fitness to justify health-related possessions (Arndt et al., 2003; Ferraro et al., 2005; Kasser & Sheldon, 2000; Routledge & Vess, 2018). Advertisements for products providing esteem- or worldview-related benefits offer a solution for reducing mortality salience (Arndt et al., 2004).

During the COVID-19 lockdown, 75% of people in Italy increased the time they spent on the Internet (Gualano et al., 2020), and in a Turkish study, more than 95% of respondents said they had followed the COVID-19 news (Özdin & Bayrak Özdin, 2020). As product keyword searches are a kind of prepurchase behavior (Jansen & Schuster, 2011), the Google search engine records of people's keyword search history helps investigation of which products may reduce COVID-19 mortality salience. In addition, people's religious worldview may mitigate the impact of their fear of death (Goplen & Plant, 2015; Pelham et al., 2018) to influence their consumption and lead to different information search behavior (Kurt & Kurt, 2021). In this pandemic, online religious search interests across nations have included attending religious worship online, searching for Bible verses, or maintaining a virtual church community (Parish, 2020). Thomas and Barbato (2020) reported that positive religious coping can reduce COVID-19-triggered anxiety both for Christians and Muslims. Therefore, in this research I argued that specific product searches and religiosity would be important indicators to explore how people cope with COVID-19 mortality salience.

Moreover, during the COVID-19 pandemic, the stay-at-home restrictions have been novel events that might trigger different consumption decisions (Zhang & Guo 2019), such as a stronger demand for home-use goods (McKinsey & Company, 2020). However, are people in regions with stronger religious beliefs more resistant to the prepurchase search of household goods than are those in regions with beliefs that are not as strong, even in searches for products, some of which can alleviate COVID-19 mortality salience? It is not clear if country-level religious search interests can interact with COVID-19 mortality salience to affect product searches nationally across product type (home-use or non-home-use). Does product type interact with COVID-19 mortality salience to affect people's online keyword search behavior for critical products?

Research Model Based on Terror Management Theory

Terror management theory (TMT) researchers (Greenberg et al., 1986) have indicated that thoughts of death activate both conscious and unconscious reactions (Pyszczynski et al., 1999). In the COVID-19 pandemic, I argue that staying at home is a conscious protection reaction (Pyszczynski et al., 2021). The consumption shift, in contrast, involves a nonconscious reaction, reflected in prepurchase Google searches for specific products. Evoking an individual's nonconscious mortality salience stimulus has been found to trigger a range of reactions, including an increase in the overall consumption level (Mandel & Smeesters, 2008), a consumption shift to apparel and entertainment products (Kasser & Sheldon, 2000), stronger intention to engage in physical fitness activities (Arndt et al., 2003), and a greater preference for luxury products (Fransen et al., 2011), and indulgent foods (Ferraro et al., 2005). The COVID-19 pandemic has led to changes in consumer behavior (Chae, 2021) and an increase in motivation keywords in mass media (Zhao et al., 2020). When stay-at-home orders entice people to search, browse, and shop online more than ever, the mortality salience evoked by COVID-19 may activate a terror management process for online viewers.

Human beings buffer their mortality salience terror with two principal moderation strategies: cultural worldview and self-esteem (Greenberg, 2012). *Cultural worldview* influences shared symbolic concepts of death for people according to their home country and their religious beliefs. Past research findings indicate that religion is a culturally provided worldview that moderates the relationship between mortality salience stimuli and people's responses (e.g., Cox & Arrowood, 2019; Henrie & Patrick, 2014). The Google search engine records search keywords. Therefore, as the proxy of religious worldview, I extracted Google search popularity indices of representative religious keywords in various countries to explore how this moderates the relationship between COVID-19 mortality salience and online prepurchase search behavior.

Developing a Prepurchase Index From Google Trends Data

Jansen and Schuster (2011) investigated the use of 40,000 Google keywords and found that 96% of product and brand keywords were searched or clicked in three online prepurchase stages: awareness, search, and decision making. Their finding supports that Google online searches for product and brand names constitute an online prepurchase information search behavior (Kotler & Keller, 2012). Google's online search market share globally as of September 2020 was 85% (Statista, 2022), and in 2020 75% of consumers said they used Google for prepurchase information search (Google, 2020).

Google Trends tracks the relative search volume (Du et al., 2020) for the Google search engine, that is, the standardized values of the relative search volumes of keywords in specific geographic and time ranges, which is scored from 0 to 100, where 0 represents no search volume and 100 represents peak query volume. For example (see Figure 1), the Google Trends graph shows that in a given time period, when comparing the two keywords "COVID19" and "perfume" in France, their search patterns seem to be negatively correlated. Researchers can download the relative search volume to check the Pearson correlation coefficient.

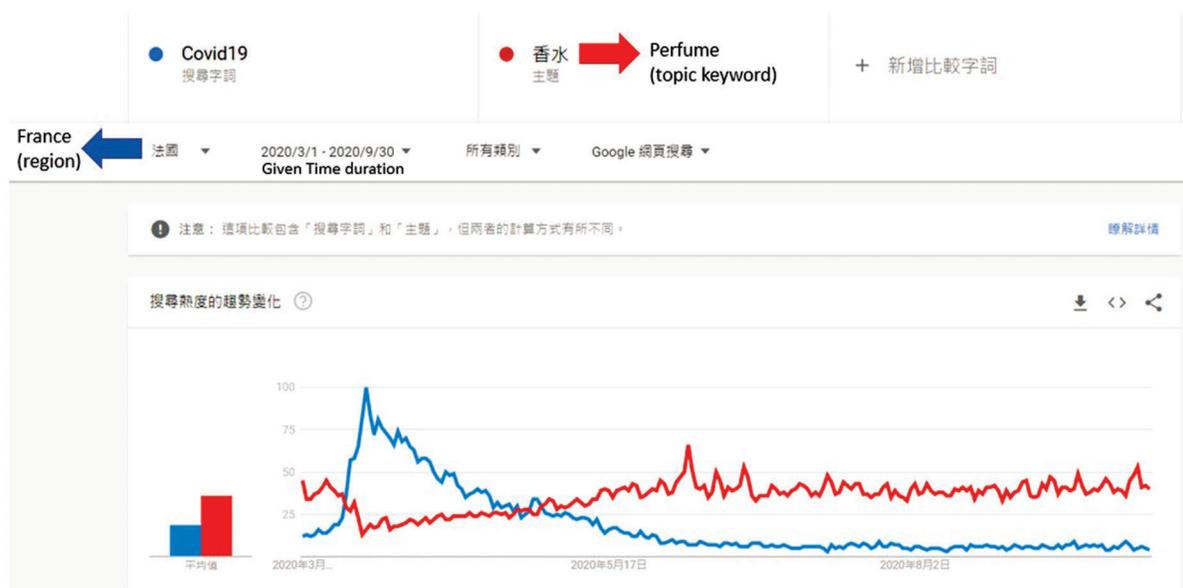


Figure 1. *Google Trends Relative Search Volume Example by Time Series*

Google Trends also provide the country-level search popularity index of any keyword, scored from 0 to 100. Topic keywords are the group of search terms sharing the same concept in any language. The search popularity index reflects the global ranking of the search interest for a given keyword (Google, 2022). For instance, Figure 2 shows that for the

topic keyword “Jesus Christ” in the given time period, Mexico ranks 31st with a score of 28 and Italy ranks 34th with a score of 23.



Figure 2. Google Trends Relative Search Volume Example by Regional Search Ranking

Researchers have previously utilized Google Trends as a valid and reliable indicator of risky behaviors, COVID-19-related emotion, protection behavior, panic buying, and economic anxiety under the pandemic (Du et al., 2020; Fetzer et al., 2020; Payne et al., 2017). Regarding the determinants of Google keyword searches, Kurian et al. (2020) found that the actual number of daily confirmed COVID-19 cases was significantly correlated with various relevant keywords on Google Trends (e.g., face mask, Lysol, and COVID stimulus check). Mavragani (2020) also indicated that the daily new case numbers and death toll were significantly related to online searches for the keyword “Coronavirus.” However, the determinants of product keyword searches during the COVID-19 pandemic have still not been definitively established in the extant research.

From a terror management perspective, reading the word “death” (Routledge & Vess, 2018) can trigger the unconscious perception of death, and people’s consumption behavior of certain commodities (Arndt et al., 2004) can help boost their self-esteem to eliminate mortality salience. Between March and August 2020, Google Trends shows that the correlation between the keywords “COVID19” and “death” was high, with a Cronbach’s alpha of .858. Therefore, I argued that COVID-19 fear of death (using the proxy of death toll) may influence the cosearch intensity of the two keywords, “COVID19” and a product (e.g., “perfume”). When people type or click a COVID-19 keyword, they may experience a terror stimulus to search a product keyword as a coping strategy. As Google Trends records such online coping behavior, I extracted the search patterns of those keywords to create the novel dependent variable, which I termed the prepurchase index.

The *prepurchase index* (PPI) consists of the Pearson correlation coefficient calculated from the downloaded daily relative search volume of two Google keywords: “COVID19” and a named product. That is, how a keyword search intensity for a product correlates with COVID-19, reflecting the national search outcome for the named product under the condition of the pandemic. A higher or lower PPI correlation coefficient (value range from -1 to 1) means a given product keyword is strongly affected by COVID-19. Hence, I selected eight products in four categories for PPIs according to TMT as follows: for entertainment (Kasser & Sheldon, 2000) the related keywords were “computers” and “Nintendo Switch”; for fitness (Arndt et al., 2003) the related keywords were “treadmills” and “shoes”; for luxury (Fransen et al., 2011) the related keywords were “lipstick,” “perfume,” and “watches”; and for food (Ferraro et al., 2005) the related keyword was “cookers.”

To form PPIs for each product, I manually extracted Pearson correlation coefficients for 75 regions for the following word pairs: “COVID19” and “lipstick,” “COVID19” and “perfume,” “COVID19” and “shoes,” “COVID19” and “watches,” “COVID19” and “treadmills,” “COVID19” and “computers,” “COVID19” and “cookers,” and “COVID19” and “Nintendo Switch.”

Hypothesis Development

I used the COVID-19 death toll as a stimulus proxy for COVID-19 mortality salience across the 75 countries to investigate the behavioral response for the eight products. A nation with a higher death toll relative to other countries indicates a more severe mortality salience stimulus (Pyszczynski et al., 2021) that might impact online prepurchase behavior. Utilizing such real-world data to assess Google Trends data is a practice adopted in recent research (Du et al., 2020; Fetzer et al., 2020; Mavragani, 2020). Thus, I proposed the following hypothesis:

Hypothesis 1: COVID-19 mortality salience will influence prepurchase behavior at a country level.

Studies based on TMT (Fransen et al., 2011; Kasser & Sheldon, 2000) have found evidence that mortality salience causes consumption shifts according to product type. It can be assumed that to better address the COVID-19 mortality salience threat when confined to their home, people have increasingly engaged in online product searches, especially for products in home-use categories. In particular, TMT researchers have observed that the home-use products I selected for testing in the current study may help relieve mortality salience irritations, because treadmills, computers, Nintendo Switch, and cookers belong to fitness, entertainment, and food categories, respectively. The results of a McKinsey and Company (2020) COVID-19 consumer pulse survey covering 33 product items in 11 countries also endorse the importance of home-use goods: compared to before the pandemic, the respondents expected to spend more on products in the categories of groceries, household supplies, and home entertainment. Thus, I developed the following hypothesis:

Hypothesis 2: Product type (home use vs. nonhome use) will moderate the relationship between COVID-19 mortality salience and consumers' prepurchase behavior for eight product keywords, such that in areas with a higher number of COVID-19 deaths, the prepurchase index for home-use products will increase and that for non-home-use products will decrease.

Religion forms part of and is integral to culture (Saroglou & Cohen, 2011), and cultural differences affect Internet use (P. Y. K. Chau et al., 2002; Li & Kirkup, 2007) and other various consumer behaviors, such as information seeking, product purchase switching behavior, consumption of luxury products, and food-wasting behavior (Choi, 2010; Hirschman, 1981; Minton & Geiger-Oneto, 2020; Minton et al., 2020). Researchers have documented that people's religious worldview moderates the effects of mortality salience on their behaviors regarding materialism, status seeking, and self-brand connection (Cohen & Hall, 2009; Jonas & Fischer, 2006; Norenzayan et al., 2009). Online religious keyword searches can be information searches prior to reading or engaging in religious consumption, according to consumer behavior theory (Kotler & Keller, 2012). Therefore, from a TMT perspective, the religious worldview proxied by the religious searching popularity index (RSPI) I developed can enhance self-esteem to mitigate the effects of COVID-19 mortality salience on specific PPIs.

Worldwide search rankings for religious keywords are similar before and during COVID-19. Taking the topic keyword “Jesus Christ” as an example, in nine of the top 10 countries for number of searches the total was the same in 2019 and 2020 on Google Trends. I extracted and developed the RSPI from Google Trend's global country rankings for selected religious keywords during the period from March 1 to September 30, 2020, as the proxy of each nation's searching strength of religious behaviors (for Christian or Islam), reflecting the proxied role of religious cultural worldview. I focused only on developing the RSPI for Christianity and Islam, as the popularity for other religions in the examined countries was relatively lower. Thus, the following hypotheses were developed:

Hypothesis 3a: The religious searching popularity index across nations will moderate the relationship between COVID-19 mortality salience and prepurchase behavior, such that in areas with a lower total for the Christian searching popularity index, the number of COVID-19 deaths will significantly affect keyword query prepurchase indices.

Hypothesis 3b: The religious searching popularity index across nations will moderate the relationship between COVID-19 mortality salience and prepurchase behavior, such that in areas with a lower total for the Islamic searching popularity index, the number of COVID-19 deaths will significantly affect keyword query prepurchase indices.

Regarding how product type moderates the relationship of religiosity and purchase behavior, prior research findings indicate that religion reduces the purchase intention for high-status or materialistic products (e.g., Cutright et al. 2014; Stillman et al., 2012). Hence, I argued that the RSPI would interact with product type and COVID-19 mortality salience. I investigated how entertainment, fitness, luxury, and food, as four types of products, might have a mitigating effect, and proposed that the search impulses of people with weak faith, as assessed using the RSPI, might increase or decrease more for specific home-use and non-home-use products, respectively, than would those of people with solid faith. Thus, I proposed the following hypotheses:

Hypothesis 4a: Product type, Christian searching popularity index, and COVID-19 mortality salience will have a three-way interaction effect on product prepurchase indices, such that in areas with a lower religious searching popularity index, the number of COVID-19 deaths will affect keyword query prepurchase indices positively for home-use products and negatively for non-home-use products.

Hypothesis 4b: Product type, Islamic searching popularity index, and COVID-19 mortality salience will have a three-way interaction effect on product prepurchase indices, such that in areas with a lower religious searching popularity index, the number of COVID-19 deaths will affect keyword query prepurchase indices positively for home-use products and negatively for non-home-use products.

The theoretical model of this study is shown in Figure 3.

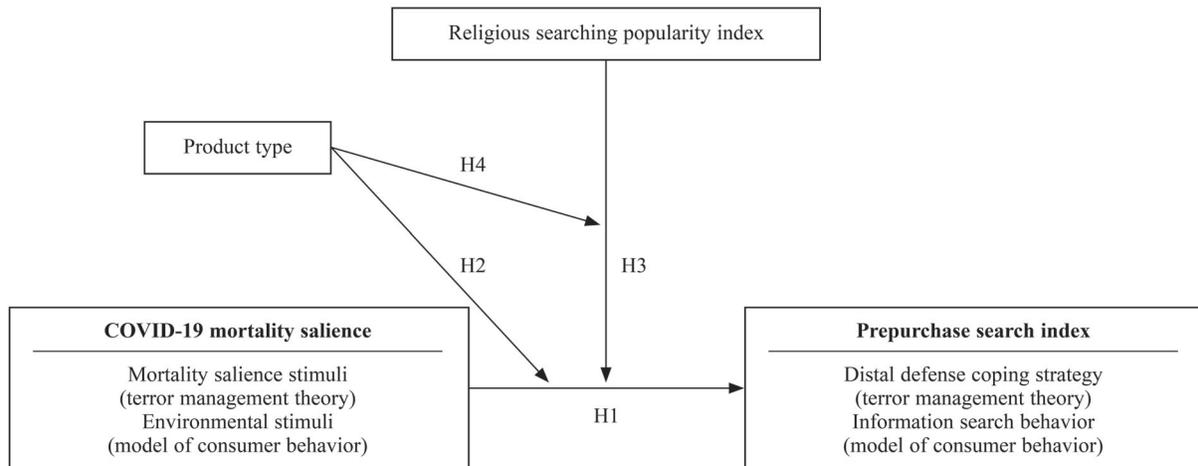


Figure 3. *Research Model*

Method

Data Source

The data for this study were obtained as follows: (a) Regarding the different times of the COVID-19 outbreak worldwide, Google Trends queries made in the period from March 1 to September 30, 2020, were collected for the following eight keywords: lipstick, perfume, shoes, watches, treadmills, computers, Nintendo Switch, and cookers. During this 7-month period, the development of the COVID-19 vaccine had not been completed, and COVID-19

mortality salience might prompt a stronger TMT distal consumption response to reduce fear. Indicating it was a terror time, in a survey of 23 countries, of which 22 completed the survey before September 30, 2020, the results showed that 56.92% of respondents felt moderate to high anxiety (Burkova et al., 2021). (b) To account for semantic variances (e.g., wristwatch/watch), for all query items a group of search terms sharing the same concept in any language (topic keywords) were employed. (c) I selected 75 countries representing all the continents of the world. (d) Individual keyword queries were made for the 75 countries to quantify the relative query volume for each product item in each country. The 75 countries (see Table 1) account for 60% of the global population and for 94% of the cumulative COVID-19 deaths in 2020.

Table 1. *Regions Included in the Study*

Sample regions						
Afghanistan	Bolivia	Estonia	Indonesia	Lithuania	Philippines	Switzerland
Albania	Brazil	Ethiopia	Iran	Luxembourg	Poland	Tunisia
Algeria	Bulgaria	Finland	Iraq	Malta	Portugal	Turkey
Argentina	Canada	France	Ireland	Mexico	Romania	United Arab Emirates
Armenia	Chile	Germany	Israel	Morocco	Russia	United Kingdom
Australia	Colombia	Greece	Italy	Netherlands	Saudi Arabia	Ukraine
Austria	Czech Republic	Honduras	Jamaica	Norway	Senegal	Uruguay
Bahrain	Denmark	Hong Kong	Japan	Pakistan	Slovenia	United States Of America
Bangladesh	Dominican Republic	Hungary	Kuwait	Panama	South Africa	Venezuela
Belarus	Ecuador	Iceland	Latvia	Paraguay	Spain	
Belgium	Egypt	India	Lebanon	Peru	Sweden	

Materials

Independent Variable

For the independent variable of mortality salience, data from the European Center for Disease Prevention and Control were used to obtain the cumulative number of COVID-19 deaths in the 75 countries included in the study sample as of September 30, 2020. Cumulative deaths per million people averaged 146 deaths in 194 countries between March 1 and September 30, 2020 (Our World In Data, n.d.). Among them, cumulative deaths per million were low in 45 countries (fewer than 10 deaths per million) and high in 149 countries (average of 190 deaths per million). I excluded from the sample those countries with fewer than 10 deaths per million people. To ensure terror management processing was a factor, across the 75 selected sample regions there was an average of 248 deaths per million people.

Dependent Variable

PPI was the dependent variable in this study, which I calculated using the Pearson correlation test to find the relative search volume of two keywords, “COVID-19” and the name of each product as taken from Google Trend’s relative search results in each region during the period from March to September, 2020. Among the eight topic product keywords, lipstick, perfume, shoes, and watches are products used away from home (classified as non-home-use products), and treadmills, computers, Nintendo Switch, and cookers are products used at home (home-use products). The PPI values range from -1 to 1 . When the correlation coefficient of the PPI is closer to 1 , the query trends of the keyword (the product) and “COVID-19” are more positively correlated for a particular country, whereas a value closer to -1 indicates a more negative correlation. The PPI, taken from the TMT’s manipulation of the keyword “death” (Routledge & Vess, 2018), shows the strength of people’s searching for product keywords as a coping strategy when searching for COVID-19.

Moderating Variables

I differentiated between home-use and non-home-use products as the first moderating variable reflecting the stay-at-home orders during the pandemic. To evaluate whether the popularity of religious searching across nations moderated the relationship between COVID-19 mortality salience stimuli and prepurchase behavior, for the second moderator of RSPI, I abstracted the topic keywords “Jesus Christ” and “Jehova” for the Christian searching popularity index (CSPI); and “Muhammad,” “Allah,” and “Islam” for the Islamic searching popularity index (ISPI). To ensure these topic keywords represented the specific religion, I avoided using the keyword “God,” which is associated with monotheism in

Google topic keywords. The Cronbach's alpha for Jesus Christ and Jehova was .88, and that for Muhammad, Allah, and Islam was .84.

The RSPI variable extracted from Google search interest ranking of all Google countries during the period from March 1 to September 30, 2020, represents Google's global search rankings. The manipulated dependent variable, PPI, is formed in a single-nation context. RSPI is at the cross-country level and PPI is at the single-country level. RSPI is the proxy of religious worldview, which has a moderating role in the traditional TMT model.

I examined a three-way interaction effect of COVID-19 mortality salience stimuli, product type, and RSPI for eight PPIs.

Control Variables

The control variables of this study included gross domestic product per capita taken from International Monetary Fund (2019) reports, and median age for each country taken from the Central Intelligence Agency of the United States of America (n.d.).

Data Analysis

Previous studies have established that there is a causal relationship between COVID-19 real-world data and Google keyword search indices (Du et al., 2020; Fetzer et al., 2020). Therefore, in this study I used hierarchical linear regression, taking 75 countries as the target population and analyzing the impact of the death toll in those countries on the PPI for keywords related to eight product items.

To explore the impact of death toll changes on each PPI (equally proportional death-toll changes to a PPI), I conducted a log transformation and standardization for the independent and control variables according to the method recommended by Du et al. (2020) and Schleifer and Bell (1994) using SPSS 22.0 and the SPSS PROCESS macro (Hayes, 2018). Log transformation of the death toll helped to predict how each real-world PPI was affected at different levels of mortality salience. Furthermore, I checked whether the CPSI or IPSI moderated the relationship between the country's COVID-19 death toll and the PPI. I also used 95% bias-corrected confidence intervals (CIs; 5,000 resamples) to estimate the statistical significance of this moderating effect. When the CI does not contain zero, a significant moderating effect is established (Hayes, 2018).

Results

COVID-19 Mortality Salience Stimuli and the Prepurchase Index

As shown in Tables 2, 3, and 4, I found that the COVID-19 mortality salience stimuli in each of the 75 countries significantly influenced the PPI of seven of the eight products (lipstick, perfume, shoes, watches, cookers, treadmills, and Nintendo Switch) with significant 95% CIs. The influence of COVID-19 mortality salience stimuli on the PPIs of the eight products in the CSPI and ISPI lists are shown in Model 3 in Tables 3 and 4. The effect on lipstick, perfume, shoes, and watches was significant and negative, and for cookers, treadmills, and Nintendo Switch it was significant and positive. No significant impact was found for computers. The models for seven of the products supported Hypothesis 1, in that across the 75 countries the COVID-19 mortality salience stimuli significantly influenced prepurchase behavior. The coefficient of determination (R^2) of the seven models exceeded .16. The correlation coefficient exceeded .40, indicating a moderate positive effect. More details are shown in Tables 2 to 4.

Table 2. Correlations Among Deaths From COVID-19, Per Capita Gross Domestic Product, Median Age, Christian Searching Popularity Index, Islamic Searching Popularity Index, and Prepurchase Index for Each Product

Variable	M	SE	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Deaths from COVID-19	13,030	3,682	1												
2. Per capita GDP (US\$)	23,901	2,774	-.165	1											
3. Median age	35.60	0.90	-.180	.772**	1										
4. CSPI	13.20	2.04	.301**	-.195	-.263*	1									
5. ISPI	8.60	1.87	.102	-.401**	-.463**	-.265*	1								
6. PPI_lipstick	-0.28	0.03	-.456**	.245*	.196	-.120	-.115	1							
7. PPI_perfume	-0.56	0.03	-.414**	.204	.169	-.275*	-.002	.539**	1						
8. PPI_shoes	-0.62	0.02	-.366**	.016	.178	-.377**	-.037	.343**	.550**	1					
9. PPI_watches	-0.67	0.02	-.468**	-.040	-.056	-.285*	.124	.379**	.336**	.378**	1				
10. PPI_Nintendo Switch	0.37	0.03	.176	.641**	.324**	-.202	.009	.036	.031	-.072	-.148	1			
11. PPI_treadmills	0.36	0.03	.289*	.185	.131	-.079	-.066	-.187	-.225	-.327**	-.185	.292*	1		
12. PPI_computers	0.37	0.04	-.029	.329**	.353**	-.003	-.286*	.024	.129	-.077	-.061	.053	.407**	1	
13. PPI_cookers	0.45	0.03	.363**	-.140	-.314**	.192	.257*	-.205	-.232*	-.553**	-.229*	.089	.229*	-.029	1

Note. N = 75. GDP = gross domestic product; CSPI = Christian searching popularity index; ISPI = Islamic searching popularity index; PPI = prepurchase index.

* p < .05. ** p < .01. *** p < .001.

Table 3. Hierarchical Regression Analysis Results for the Christian Searching Popularity Index

	PPI_lipstick			PPI_perfume			PPI_shoes			PPI_watches		
	M1	M2	M3	M1	M2	M3	M1	M2	M3	M1	M2	M3
Per capita GDP (US\$)	.232	.204	.186	.183	.164	.133	-.301	-.313	-.320	.008	-.016	-.021
Median age	.016	-.030	-.022	.028	-.061	-.049	.410*	.297	.300	-.062	-.176	-.174
COVID-19 deaths		-.440***	-.404**		-.353**	-.287*	-.281*	-.265*			-.441***	-.432***
CSPI		.045	.001		-.153	-.229*		-.275*	-.293*		-.202	-.213
CSPI × COVID-19 deaths			.165			.289**			.069			-.042
R ²	.060	.240	.265	.042	.211	.287	.068	.254	.259	.003	.274	.276
ΔR ²		.180**	.025		.169**	.076**		.186***	.004		.271***	.002
	PPI_Nintendo Switch			PPI_treadmills			PPI_cookers			PPI_computers		
	M1	M2	M3	M1	M2	M3	M1	M2	M3	M1	M2	M3
Per capita GDP (US\$)	.968***	.993***	1.012***	.209	.235	.252	.254	.273	.266	.140	.139	.136
Median age	.420**	-.440**	-.451***	-.030	-.024	-.031	-.510**	-.461**	-.458**	.245	.272	.273
COVID-19 deaths		.327***	.285**		.369**	.331**		.316**	.330**		.016	.023
CSPI		-.220**	-.175*		-.151	-.107		.030	.013		.090	.083
CSPI × COVID-19 deaths			-.182*			-.164			.062			.028
R ²	.483	.595	.625	.035	.159	.183	.125	.227	.230	.132**	.141	.142
ΔR ²		.112***	.030*		.124**	.025		.102*	.004		.009	.001

Note. Standardized coefficients are presented. Model 1 = control variables (per capita GDP and median age); Model 2 = control variables (per capita gross domestic product and median age), the independent variable (COVID-19 deaths), and the moderating variable (Christian searching popularity index); Model 3 = (main model) control variables (per capita GDP and median age), independent variable (COVID-19 deaths), moderating variable (Christian searching popularity index), and the interaction term (Christian searching popularity index × COVID-19 deaths). GDP = gross domestic product; CSPI = Christian searching popularity index.

* p < .05. ** p < .01. *** p < .001.

Table 4. Hierarchical Regression Results for the Islamic Searching Popularity Index

	PPI_lipstick			PPI_perfume			PPI_shoes			PPI_watches		
	M1	M2	M3	M1	M2	M3	M1	M2	M3	M1	M2	M3
Per capita GDP (US\$)	.232	.204	.249	.183	.171	.176	-.301	-.318	-.284	.008	-.009	.041
Median age	.016	-.040	-.124	.028	.020	.011	.410*	.383*	.322	-.062	-.075	-.165
COVID-19 deaths		-.430***	-.350**		-.395**	-.386**		-.354**	-.294*		-.497	-.409***
ISPI		-.010	-.118		.116	.104		.049	-.033		.136	.015
ISPI × COVID-19 Deaths			.223		.025	.025		.169				.249*
R ²	.060	.238	.272	.042	.202	.202	.068	.191	.210	.003	.254	.296
ΔR ²		.178**	.034		.160	.000		.123**	.019		.251***	.042*

	PPI_Nintendo Switch			PPI_treadmills			PPI_cookers			PPI_computers		
	M1	M2	M3	M1	M2	M3	M1	M2	M3	M1	M2	M3
Per capita GDP (US\$)	.968***	1.011***	.998***	.209	.229	.175	.254	.290	.257	.140	.127	.092
Median age	-.420**	-.290*	-.269*	-.030	.012	.109	-.510**	-.411*	-.352*	.245	.193	.255
COVID-19 deaths		.264**	.240**		.329**	.234*		.321**	.263*		.042	-.018
ISPI		.251**	.283**		-.002	.129		.150	.230		-.150	-.066
ISPI × COVID-19 Deaths			-.067			-.270*			-.165			-.171
R ²	.483	.601	.604	.035	.139	.189	.125	.243	.262	.132	.152	.171
ΔR ²		.118***	.003		.105*	.049*		.119**	.018		.019	.020

Note. Standardized coefficients are presented. Model 1 = control variables (per capita GDP and median age); Model 2 = control variables (per capita gross domestic product and median age), the independent variable (COVID-19 deaths), and the moderating variable (Islamic searching popularity index); Model 3 = (main model) control variables (per capita GDP and median age), independent variable (COVID-19 deaths), moderating variable (Islamic searching popularity index), and the interaction term (Islamic searching popularity index × COVID-19 deaths). GDP = gross domestic product; ISPI = Islamic searching popularity index.

* $p < .05$. ** $p < .01$. *** $p < .001$.

The Moderating Role of Product Type

Product type moderated the relationship between COVID-19 mortality salience stimuli and prepurchase behavior. Thus, Hypothesis 2 was supported. In nations with higher mortality salience stimuli, searches for cookers, Nintendo Switch, and treadmills increased significantly in number, whereas searches for lipstick, perfume, shoes, and watches dropped significantly. Without considering the RSPI, home-use and non-home-use products were either significantly positively or significantly negatively influenced by the death toll.

The Influence of the Religious Searching Popularity Index on Product Prepurchase Indices

The RSPI significantly influenced each specific product PPI. In Model 3 of Table 3, the CSPI significantly influenced the PPIs for perfume, shoes, and Nintendo Switch. In Model 3 of Table 3, the ISPI significantly influenced only the PPI for Nintendo Switch.

The Interaction Effects

Hypotheses 3a and 4a were also supported. The death toll and the RSPI had an interaction effect on the PPI for Nintendo Switch and perfume in the CSPI model (see Table 3), supporting Hypothesis 3a. As Nintendo Switch and perfume are home-use and non-home-use products, respectively, Hypothesis 4a was also supported. With a higher CSPI, the slope was lower in both product indices (see Figures 4 and 5) and even reversed the COVID-19 mortality salience impact on perfume, a non-home-use product (see Figure 5). Thus, Hypotheses 3b and 4b were also verified. As shown in Table 4, the death toll (COVID-19 mortality salience stimuli) interacted with the ISPI on both the home-use product (treadmill) and the non-home-use product (watch). With a higher ISPI, the slope was lower in both product indices (see Figures 6 and 7), and also reversed the COVID-19 mortality salience stimuli on treadmills (the home-use product; see Figure 6).

Furthermore, I performed a simple main effects analysis to test the impact of the COVID-19 death toll on each product's PPI ($M \pm 1 SD$ of the two RSPI dimensions; Hayes 2018), and the results are shown in Figures 4 to 7. At $M + 1 SD$ and on the mean for the CSPI the main impact of the COVID-19 death toll on Nintendo Switch was significantly higher, 95% CI [0.0734, 0.1805] and [0.0333, 0.1174], and perfume was significantly lower, 95% CI [-0.2002, -0.0725] and [-0.1156, -0.0154], respectively. At $M + 1 SD$ for the ISPI, the main impact of the COVID-19 death toll on treadmills was significantly higher, 95% CI [0.0558, 0.1994]; while at $M - 1 SD$ and on the mean for the ISPI, the main impact of the COVID-19 death toll on watches was significantly lower, 95% CI [-0.1709, -0.0766] and [-0.1335, -0.0393], respectively.

The CSPI and the ISPI both alleviated COVID-19 mortality salience power for both non-home-use and home-use products. The four PPIs were significantly influenced by COVID-19 mortality salience stimuli, RSPI, and product type. I further found that countries with a higher RSPI had a lower search impulse than did those countries with a lower RSPI. The death toll significantly influenced the PPIs mainly in countries where the RSPI was lower. The RSPI regulated online prepurchase searches for specific products under the COVID-19 threat context.

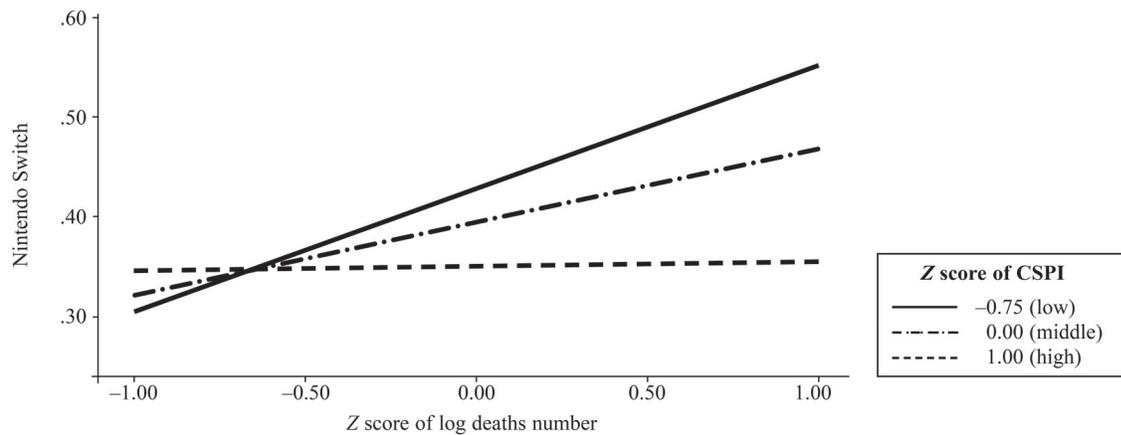


Figure 4. *The Interaction of Christian Searching Popularity Index and Prepurchase Index for Nintendo Switch*

Note. CSPI = Christian searching popularity index.

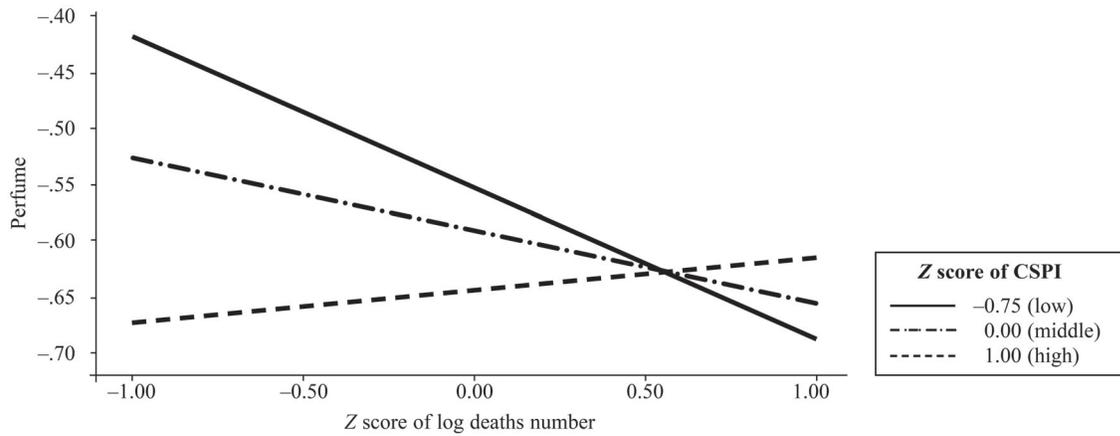


Figure 5. *The Interaction of Christian Searching Popularity Index and Prepurchase Index for Perfume*
 Note. CSPI = Christian searching popularity index.

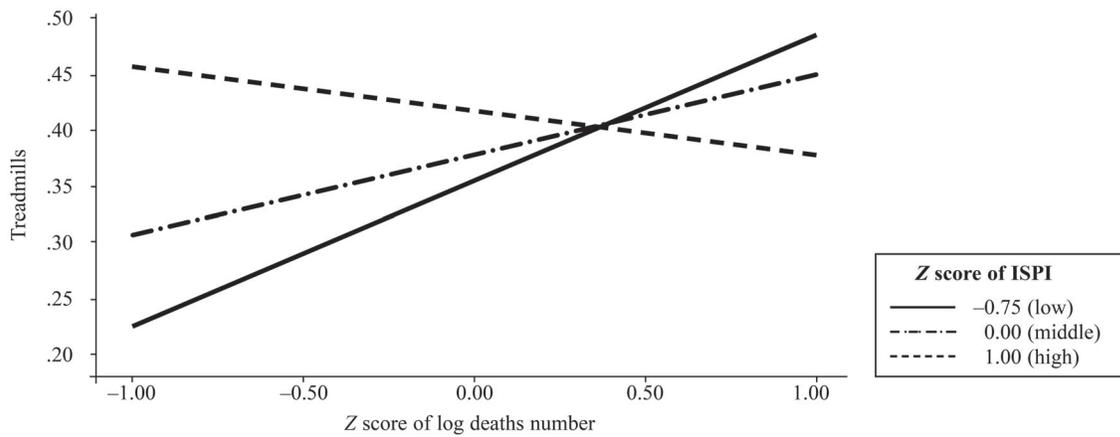


Figure 6. *The Interaction of Islamic Searching Popularity Index and Prepurchase Index for Treadmills*
 Note. ISPI = Islamic searching popularity index.

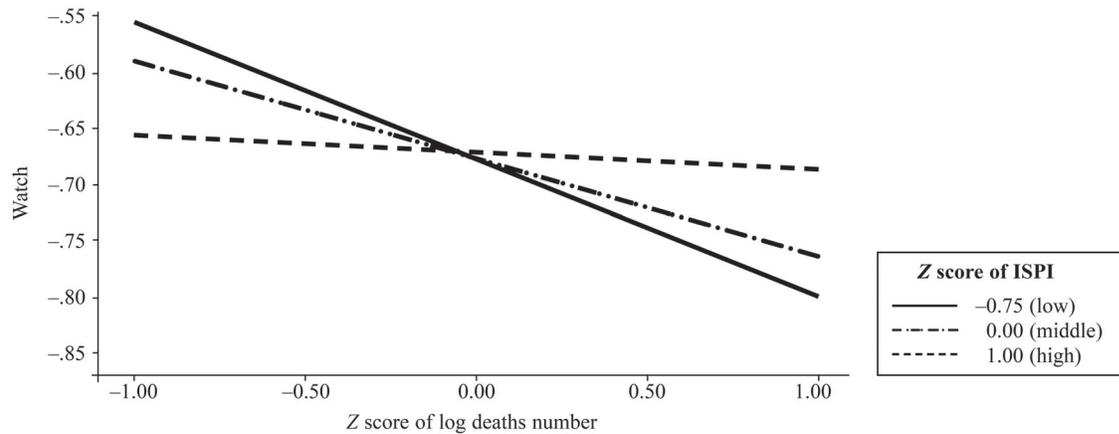


Figure 7. *The Interaction of Islamic Searching Popularity Index and Prepurchase Index for Watches*
 Note. ISPI = Islamic searching popularity index.

Discussion

Major Conclusions

The findings of this research support previous laboratory research propositions (Arndt et al., 2003; Fransen et al., 2011; Kasser & Sheldon, 2000) but from a novel multinational view. The interaction effect of COVID-19 mortality salience stimuli and the RSPI leads to significantly different online prepurchase behavior regarding home-use and non-home-use products, reflecting the interaction effect of a religious worldview, product type, and COVID-19 mortality salience.

The impact of COVID-19 on the global market is not entirely negative. Results indicate that although the number of COVID-19 deaths had a significant impact on online prepurchase behavior, this behavior in regard to the products for home use that I tested was more frequent during the COVID-19 pandemic compared with previously. Conversely, the number of prepurchase searches over the same period reduced for the non-home-use products I tested, including lipstick, perfume, shoes, and watches. Third, my results show that the RSPI across nations moderated the relationship between COVID-19 mortality salience stimuli and the PPI, in the case of the CSPI for perfume and Nintendo Switch, and in the case of the ISPI for watches and treadmills. I conclude that there is a three-way interaction effect of COVID-19 mortality salience stimuli, product type, and the RSPI (both ISPI and CSPI) for these four products. Both the RSPI and product type played critical roles in mitigating consumption impulse for specific products to reflect how the stay-at-home order interacts with religious search interest across nations. My findings in this study reveal that home-use or non-home-use products were not always the winners or losers as regards prepurchase search during the COVID-19 pandemic.

Theoretical Contributions

This research provides several theoretical contributions to the consumer behavior literature. First, I have demonstrated terror management processes outside the laboratory in a wider global context. To the best of my knowledge, this study is the first academic research conducted to investigate people's macro prepurchase behaviors across multiple countries during the COVID-19 pandemic. I have addressed a knowledge gap by exploring the country-level drivers of death toll, RSPI, and product type for proximal and distal online search behavior. Second, many mediating variables influence the

relationship between environmental stimuli and consumers' information search behavior (Kotler & Keller, 2012). The model I used in my study leverages objective real-world data to demonstrate the significant direct effect of COVID-19 mortality salience stimuli on product prepurchase searches. Third, I have used a replicable TMT model to establish which, out of the RSPI or the product type, is the moderating power that influences people's impulse to search for a product, and to what degree. The three-way interaction I recorded demonstrates that the RSPI leverages not only the relationship between mortality salience and proximal defenses, that is, the conscious reaction to staying at home regarding the search for home-use and non-home-use products, but also leverages the relationship between mortality salience and distal defenses, that is, nonconscious reactions to consumption shift, regarding the search for luxury, fitness, and entertainment products. With this model I successfully examined TMT researchers' conceptual frame: proximal and distal response are two ways of reacting against COVID-19 mortality salience thoughts (Courtney et al., 2020; Pyszczynski et al., 2021). Fourth, I demonstrated that the PPI for a product is significantly influenced by the death toll in the 75 countries in my sample where the RSPI was lower. This multinational phenomenon partially echoes prior research showing that religion reduces the purchase intention for high-status or materialistic products (e.g., Cutright et al. 2014; Stillman et al., 2012) reflected in my data for Nintendo Switch, perfume, treadmills, and watches. Fifth, this study enriches knowledge of prepurchase information search behavior by demonstrating that real-world fatalities can also be a determinant of product search keywords, not just health-related search keywords (Kurian et al., 2020; Mavragani, 2020).

Managerial Implications

This study has important implications worldwide for commodity manufacturers, grocery retailers, policymakers, and the public. First, for commodity manufacturers and retailers, creating new target PPIs and utilizing this model may help provide a filter to identify potential countries for target product demand forecasts, supply chain management, and marketing differentiation. Moreover, companies facing falling sales because of COVID-19 can use this research approach to identify investment opportunities for other products for which sales may increase during the pandemic. Second, creating target PPIs and adapting this model will help policymakers foresee sales trends in their industry, and they can then distribute limited resources to support suitable companies or industries. Governments can replicate these approaches to identify target commodities as distal coping strategies to relieve COVID-19 mortality salience fear. Third, my results indicate that the RSPI can regulate people's search impulse for specific products. Most governments have focused on preventing the virus spreading from panic buying behaviors in physical channels; they can consult my findings to invest in Google religious keyword advertising to ease the search impulse for specific products. Fourth, a wide range of people may use this model for its replication value. For example, stock investors can explore more product PPIs to select potential companies; marketers can easily identify the most popular products for consideration as promotion-incentive candidates; consumers and the mass media may use this to understand the price growth for specific product items in their country; and small business owners or investors can decide on their product strategies. Because some products, such as some treadmills, video-game machines, cooking appliances, and electric products, are designed and assembled with semiconductors wafers, in a pandemic any shortage of these components will have adverse effects on the macro product supply for electric consumer-goods industries, which may lead to a price increase for the products. Governments can utilize my model to forecast popular products and know the future demand for semiconductor wafers.

Limitations and Future Research Directions

The exclusive use of data sourced from Google Trends constitutes a limitation of the current research. Other search engines, such as Yahoo!, Yandex, and Baidu, are also widely used throughout the world, and data from multiple search engines can be incorporated in future research to provide more robust results. However, as Google's search engine had 85% of the global online search market share in September 2020 (Statista, 2022), this seemed to be the best choice for my research. In addition, I cannot confirm or deny if there are more appropriate names for the target products in any particular country than the topic keywords I used. However, only topic keywords can be translated into various languages to facilitate cross-country comparisons. Finally, searching for religious keywords cannot fully represent the piety of religious beliefs, because devout people may choose to attend a service of worship instead of searching for

religious keywords. However, with many people staying at home during COVID-19, the popularity of religious readings and gatherings online has heightened the importance of the RSPI.

This model is not specific only to COVID-19. The keyword query results surrounding an emerging historical event can be accessed as Google Trends data. Future researchers can use the model I proposed to develop a suitable index, such as the PPI, in response to such events. According to Arndt et al. (2004), when the going gets tough, the tough go shopping and online searching. With this model, future researchers can achieve greater accuracy in distinguishing which products reduce mortality salience fear. Manipulating or advertising accurate product keywords may help people to weather such a pandemic.

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