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How mortality salience hurts brands with different personalities ☆

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ABSTRACT

From deadly disease outbreaks to crimes and terrorism, consumers often experience mortality salience (MS). This research examines how MS-inducing events impact brand evaluations. We propose that under MS, consumers avoid experiencing change. Because consumers perceive brands with an exciting personality to be more closely associated with the notion of change than brands with other types of personality, the onset of MS is more likely to hurt the evaluations of exciting brands than those of other brands. Study 1, a large-scale secondary data study, showed that the 9/11 terror attacks degraded consumers' evaluations of exciting brands but not of other types of brands. Subsequent studies demonstrated causality and the underlying mechanism. In Study 2, experimentally inducing MS decreased evaluations of an exciting brand but not of a control brand. Using a process-by-moderation approach, Study 3 showed that manipulating consumers' perception of the extent to which an exciting brand was associated with the notion of change moderated the negative impact of MS on brand evaluations. Studies 4a-4b demonstrated that consumers' tendency to avoid experiencing change mediated the detrimental effect of MS on the evaluations of an exciting brand but not of a control brand. These findings add to the literature on branding and offer practical insights for brand management during crises.
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1. Introduction

Brands often operate in environments in which consumers experience mortality salience (MS). In fact, death is one of the top themes news outlets cover, and the level of coverage can increase by more than threefold after major deadly events (Factiva, 2023). Moreover, consumers can experience potentially deadly events themselves (e.g., disease outbreaks like COVID-19, natural disasters like earthquakes or hurricanes, deadly crimes, terror attacks like 9/11). Prior research suggests that such exposures can lead to the onset of MS (Greenberg, Solomon, & Pyszczynski, 1997), which can substantively influence consumer behavior (Dunn, White, & Dahl, 2020; Ferraro, Shiv, & Bettman, 2005; Huang, Huang, & Jiang, 2018). Yet,

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relatively little is known about how events that induce MS can impact brands. The current research adds to the marketing literature by exploring how MS affects brands with different personalities and by testing a mechanism underlying this effect.

Building on extant research on brand personality (Aaker, 1997; Geuens, Weijters, & De Wulf, 2009), we argue that consumers tend to associate exciting brands with the notion of change, perceiving that exciting brands can change their elements more than brands with other types of personality. Further, prior research on mortality salience suggests that, when experiencing increased MS, people seek to maintain their existing states in many domains, from adhering to their extant worldviews to committing to stable personal relationships (Greenberg et al., 1997; Florian, Mikulincer, & Hirschberger, 2002). Extending this research stream, we propose that the onset of MS can increase consumers' tendency to avoid experiencing change. Thus, the onset of MS is more likely to hurt the evaluations of exciting brands than other types of brands.

We find converging evidence for these propositions across a series of studies, using different methodologies and a variety of MS and brand personality operationalizations. Pilot Studies 1 and 2 showed that brands with an exciting personality tend to be more closely associated with the notion of change than brands with other personalities. Study 1, a large-scale secondary data study involving 35,914 U.S. consumers and 2644 brands, examined how the 9/11 terror attacks impacted evaluations of brands with different personalities. Using a difference-in-differences approach, Study 1 showed that consumer-based brand equity of exciting brands significantly decreased following 9/11, but this pattern was not found for brands with other personalities. Study 2 demonstrated the causal nature of this detrimental effect in an experimental setting. Studies 3 and 4 provided evidence for a change-avoidance based mechanism. Study 3 showed that manipulating consumers' perception of the extent to which an exciting brand was associated with the notion of change moderated the negative impact of MS on brand evaluations. Studies 4a–4b showed that consumers' tendency to avoid experiencing change mediated the effect of MS on exciting brands.

These findings add to the marketing literature and offer actionable managerial insights. First, we identify a previously undocumented, detrimental effect of MS on brands and a change-avoidance based mechanism underlying this effect. These results complement the growing stream of research on how MS affects marketing (Dunn et al., 2020; Gobrecht & Marchand, 2022; Huang et al., 2018). We show that because consumers perceive different brand personalities to be associated with the notion of change to different degrees and because consumers tend to avoid experiencing change when under MS, contexts that engender MS are more likely to hurt exciting brands than other types of brands. Second, our findings add to the previous literature on MS, which largely focused on individuals' tendency to avoid experiencing actual change, such as avoiding innovative products (Boeuf, 2019) or variety in consumption (Huang & Wyer, 2015). Our research shows that under MS, consumers tend to avoid the mere notion of change with which the exciting brands are more closely associated. Third, our research complements the literature on branding (Aaker, 1997; Aaker, Fournier, & Brasel, 2004; Geuens et al., 2009) by demonstrating that a prevalent contextual variable—MS—can interact with brand personality to influence the evaluations of brands. This is important because the vast majority of prior research has focused on how different brand personalities interact with other brand elements (Brasel & Hagtvedt, 2016) or consumer characteristics (Malär, Krohmer, Hoyer, & Nyffenegger, 2011; Swaminathan, Stille, & Ahluwalia, 2009). Less is known about the interplay between brand personalities and contextual variables such as MS-inducing events. Our research thus helps fill this gap in the brand personality literature. Finally, this research offers important managerial insights. We highlight the adverse effect of MS-inducing events on the evaluations of exciting (vs. other) brands. This finding is important because brands with an exciting personality are highly prevalent in the marketplace (Luffarelli, Stamatogiannakis, & Yang, 2019) and the impact of this personality on brand equity has been growing over time (Luffarelli, Delre, & Landgraf, 2022). Moreover, the exciting aspects of a brand personality can often become salient when firms leverage the feelings of excitement in their branding activities (Pham and Sun, 2020). Finally, we also identify a means through which marketers can address this detrimental effect of MS on the exciting brands—changing consumers' perception of the extent to which an exciting brand is associated with the notion of change.

2. Conceptual background

2.1. Brand personality

Brands can be categorized according to their personalities—sets of human-like characteristics associated with brands, including exciting, sincere, competent, sophisticated, and rugged personalities (Aaker, 1997). Brand personality dimensions mirror some of the human personality types (Malär et al., 2011). For instance, the exciting brand personality corresponds to the human personality dimension of extroversion because both convey the notions of sociability, energy, and activity (Aaker, 1997, p. 353). These parallels enable consumers to view a brand as if it were a person possessing relevant human traits (e.g., being extroverted), to build relationships with the brand (e.g., lighthearted, fling-like relationships, Aaker et al., 2004), and to use the brand to communicate who they are to other people (e.g., trendy, irreverent).

Brand personality has important marketing implications. Marketers can leverage the same brand personality across numerous product categories. To illustrate, brands such as Red Bull, Nike, and T-Mobile champion the exciting brand personality in different product categories (beverages, apparel, and telecommunications). Prior research has shown that brand personality can impact consumers' preferences (Swaminathan et al., 2009), brand attachment (Malär et al., 2011), brand loyalty

(Kressmann et al., 2006), consumers' reactions to brand transgressions (Aaker et al., 2004), brand equity (Sirrianni, Bitner, Brown, & Mandel, 2013), and brand financial valuation (Luffarelli et al., 2019).

To date, most of the existing research on brand personality has focused on how other brand elements or consumer characteristics can influence consumers' reactions to brands with different personalities. Relatively little is known about how exogenous environmental factors may interact with brand personality to impact consumers' evaluations. Understanding this interaction is important because brands operate in environments that are often influenced by major exogenous factors (Whitler, Besharat, & Kashmiri, 2021) such as terror attacks (Ruvio, Somer, & Rindfleisch, 2014) or deadly viruses like COVID-19 (Galoni, Carpenter, & Rao, 2020; Yang & Ma, 2021, 2023). In this research, we seek to add to the literature by investigating how and why MS-inducing events may impact brands with different personalities.

2.2. Mortality salience

Death-related information, particularly when it is perceived as self-relevant (Huang et al., 2018), evokes thoughts about one's own demise and makes one's mortality salient (MS). Death is arguably the worst kind of change from a person's current state (i.e., being alive). That is, under MS, an individual must contend with an existential threat (Greenberg et al., 1990). This can affect many psychological constructs such as cognition patterns (Schimel et al., 1999), worldviews (Greenberg et al., 1990), and behaviors (Yen & Lin, 2012). A pervasive theme underlying many MS effects is that individuals tend to avoid experiencing change and maintain their current states across multiple domains when they are under MS. To illustrate, MS can drive people to be more supportive of ideologies that offer "a stable conception of the world" and less supportive of ideologies that "are more open to change" (Burke, Kosloff, & Landau, 2013, p. 185). MS can also make people express stronger approval (vs. disapproval) of opinions that are consistent with (vs. deviate from) their present worldviews (Greenberg et al., 1997). Moreover, MS can increase people's willingness to maintain existing relationships with their partners (Florian et al., 2002). In marketing domains, MS can make consumers shun away from unfamiliar options (Huang & Wyer, 2015) and can decrease consumers' evaluations of new, innovative products (Boeuf, 2019). Relatedly, the threat of COVID-19 can reduce consumers' preference for less-familiar products (Galoni et al., 2020).

Although prior literature provides important insights into the effects of MS on consumer behavior (Dunn et al., 2020; Ferraro et al., 2005; Gobrecht & Marchand, 2022; Huang et al., 2018) and product preference (Boeuf, 2019; Huang & Wyer, 2015), there have been relatively few studies on the relationship between MS and brands. In their conceptual framework, Maheswaran and Agrawal (2004) theorize that the relationship between MS and brand evaluations is moderated by a brand's country-of-origin. In addition, Mandel and Heine (1999) demonstrate that MS can increase consumers' preferences for products of higher-status brands (e.g., Lexus cars and Rolex watches) over those of lower-status brands (e.g., Chevrolet cars and Pringles chips). Finally, Rindfleisch, Burroughs, and Wong (2009) show that, under MS, materialistic individuals may form stronger connections with the brands they own. Although these works collectively suggest that MS can impact brand evaluations, it is still unknown whether the influence of MS may be contingent on brand personality. Brand personality is an important construct in branding (Aaker, 1997; Malär, Nyffenegger, Krohmer, & Hoyer, 2012), and is conceptually distinct from product preference, status consumption, or consumer-brand connections, which the MS literature in marketing has studied thus far. To help fill this gap in the literature, we investigate whether and why brand personality may interact with MS to impact consumers' evaluations of brands.

2.3. Exciting brand personality and the notion of change

Brands are encoded in consumer memory as a part of an associative network (Keller, 1993). These associations inform consumers' perceptions and expectations about different brand elements (Freling & Forbes, 2005; Hoch & Deighton, 1989). A brand's associative network includes a unique set of characteristics linked to its personality (see Appendix A for a list of traits of each brand personality; Aaker, 1997). As such, we argue that these brand personality-specific, distinctive characteristics can lead to differences in consumer perceptions of a brand, including the extent to which a brand is associated with the notion of change.

We focus on brands with varying degrees of exciting personality. Following prior research (Aaker, 1997; Luffarelli et al., 2019; Luffarelli et al., 2022), we operationalize non-exciting brands as those that score low on the personality dimension of excitement and may (or may not) score high on other personality dimensions.¹ We propose and test that a brand's association with the notion of change is a function of the extent to which the brand has an exciting personality. That is, consumers may not associate non-exciting brands with the notion of change to the same degree as the exciting brands.

Prior research on brand personality highlights a strong link between the notion of change and different elements of exciting brands. In terms of product offering, Sundar and Noseworthy (2016) explored how the discrepancy between consumers' initial expectations (e.g., a product looks lightweight) and subsequent experience with product features (e.g., a product is heavy) impacts brand evaluations. The authors showed that consumers tend to associate exciting brands with product fea-

¹ In the secondary dataset, we find that a low score on the personality of excitement is typically accompanied by a high score on at least one other personality. This may occur because managers spend a lot of time and resources on imbuing brands with unique characteristics. To illustrate, in Study 1 none of the brands in our dataset had ratings in the lower 5% for all brand personalities. Only 8 out of 12,443 observations had ratings in the lower 5% for four brand personalities.

tures that differ from their expectations. For visual brand elements, consumers associate brands with an exciting personality with logos that have fewer repetitive patterns (e.g., Luffarelli et al., 2019) and imagery that projects variation instead of stability (e.g., Brasel & Hagtvedt, 2016). For consumer-brand relationships, consumers perceive exciting brands as capable of transgressions because they encourage consumers to “expect the unexpected” (Aaker et al., 2004, p. 13). For consumption, consumers associate exciting brands with less ritualized consumption patterns (Ran & Wan, 2023) and mere exposure to exciting brands can switch one’s mental state away from boredom (Trump & Newman, 2021). Collectively, these findings suggest that consumers can associate exciting brands with the notion of change, perceiving that exciting brands tend to change their elements more than non-exciting brands.

This pattern was confirmed in two Pilot Studies (see [Appendices A1 and A2](#)). The first Pilot Study tested whether consumers perceive that exciting brands tend to change more than other brands and what specific elements consumers expect these brands to change. One hundred U.S. consumers ($M_{\text{age}} = 39$ years; 46% women) were recruited from a consumer panel. Every participant saw five short brand descriptions, each containing traits of one of the five brand personalities (Aaker, 1997). These descriptions were presented one at a time and in random order. Because brand perceptions can pertain to various marketing aspects, for each individual description, participants were asked to report on six separate scales how much they perceived the brand to change its product offering, image, price, promotion, distribution, and target audience (1 = “Not at all change,” 7 = “Change a lot”). As expected, participants perceived that the exciting brands tend to change to a greater degree than brands with any other personality on all brand elements (all 24 p values < 0.04; see [Table A2 in Appendix A1](#) for brand element ratings of all brand personalities). Moreover, participants’ perceptions of changes in exciting brands were significantly above the mid-point of the scale (4 = “Change somewhat”) for all brand elements ($M_{\text{product}} = 5.50$, $SD_{\text{product}} = 1.35$, $t(99) = 11.16$, $p < .001$, Cohen’s $d = 1.12$; $M_{\text{image}} = 5.15$, $SD_{\text{image}} = 1.55$, $t(99) = 7.44$, $p < .001$, Cohen’s $d = 0.74$; $M_{\text{price}} = 4.65$, $SD_{\text{price}} = 1.35$, $t(99) = 4.81$, $p < .001$, Cohen’s $d = 0.48$; $M_{\text{promotion}} = 5.51$, $SD_{\text{promotion}} = 1.30$, $t(99) = 11.63$, $p < .001$, Cohen’s $d = 1.16$; $M_{\text{distribution}} = 4.89$, $SD_{\text{distribution}} = 1.54$, $t(99) = 5.79$, $p < .001$, Cohen’s $d = 0.58$; $M_{\text{target_audience}} = 4.58$, $SD_{\text{target_audience}} = 1.46$, $t(99) = 3.98$, $p < .001$, Cohen’s $d = 0.40$; see [Appendix A1](#)). That is, across brand elements, consumers indeed perceived that exciting brands tend to change more than brands with other personalities. The second Pilot Study (see [Appendix A2](#)) further confirmed this pattern, showing that the exciting brand personality (unlike other brand personalities) was associated with the notion of change more strongly ($M = 5.44$, $SD = 0.84$; $t(52) = 12.52$, $p < .001$, Cohen’s $d = 1.72$).

In summary, we propose that:

- (a) Consumers perceive exciting brands to be more closely associated with the notion of change than non-exciting brands.
- (b) The onset of MS increases consumers’ change-avoidance tendency.
- (c) As a result, exciting but not other brands are likely to be evaluated less favorably when consumers experience MS.

In the following sections, we report five studies that test the proposed effect and its underlying mechanism. To demonstrate the robustness of our findings, we use different operationalizations of MS (i.e., the 9/11 terror attacks in Study 1, an established MS induction task in Study 2, a war context in Study 3, and the COVID-19 pandemic context in Studies 4a–4b). We also utilize a variety of operationalizations of brand personality. These approaches have been widely used in prior research (e.g., Ferraro et al., 2005; Johar, Sengupta, & Aaker, 2005; Luffarelli et al., 2019) and help demonstrate that our effect is not driven by a specific MS-inducing task or by specific exciting brand personality traits. Moreover, we show that our effect holds across multiple product and service categories that vary in conspicuousness, hedonicity, and perceived risk (Study 1), and across for-profit (Study 2, Studies 4a–4b) and non-profit brands (Study 3).

3. Study 1: Secondary data evidence for the effect

Study 1 aimed to test whether MS can negatively impact evaluations of exciting but not other brands using secondary data. We examined a real-world, deadly event—the 9/11 terror attacks—as an exogenous shock that temporarily induced MS for American consumers (Ferraro et al., 2005; Landau et al., 2004; Pyszczynski et al., 2006). We used a difference-in-differences approach to examine the change in evaluations of brands with different personalities before and after 9/11.

3.1. Data

We obtained the Brand Asset Valuator (BAV) dataset.² The BAV is considered “the most comprehensive global database of consumers’ perceptions on brands” (Batra, Zhang, Aydinoglu, & Feinberg, 2017, p. 915), because it comprises perceptions of tens of thousands of consumers on thousands of brands from numerous product and service categories. The BAV has been widely used in scholarly research (Batra et al., 2017; Datta, Ailawadi, & Van Heerde, 2017; Heitmann, Landwehr, Schreiner, & van Heerde, 2020; Lovett, Peres, & Shachar, 2013; Luffarelli et al., 2019; Luffarelli et al., 2022; Mizik and Jacobson, 2008, 2009). Prior works have demonstrated the validity and practical significance of the BAV data. For example, research has shown that the BAV measures can predict online and offline word-of-mouth (Lovett et al., 2013), stock returns (Mizik & Jacobson, 2008), sales (Datta et al., 2017), market share (Heitmann et al., 2020), and firm financial valuation (Mizik & Jacobson, 2009).

² For details about this proprietary dataset please contact the corresponding author.

For the U.S. market, the BAV data were collected on a quarterly basis. The BAV data for our main analysis covered six sequential calendar quarters, from the 1st quarter of 2001 to the 2nd quarter of 2002. That is, the data covered three brand-quarter observations in the time period preceding 9/11 and three brand-quarter observations in the time period following 9/11. This unbalanced panel dataset³ covered 2644 unique brands across 27 product and service categories for a total of 12,443 brand-quarter observations (see Table B1 in Appendix B for details on sample description). Overall, our dataset contained brand perceptions and evaluations by 35,914 consumers over the six-quarter time period. This sample was representative of the U.S. population and included major brands (e.g., Google, MTV, Walmart, Six Flags) from a wide variety of product and service categories (e.g., tech, media, retail, entertainment).

3.2. Measures

We operationalized brand evaluations as the BAV's Brand Asset score. It measured consumer-based brand equity (CBBE) using four key dimensions: differentiation (a brand's ability to capture consumer attention), relevance (brand's meaningfulness and appropriateness in the marketplace), esteem (how well a brand delivers on its promise), and knowledge (how well consumers understand the brand; BAV Group (2023)). The CBBE scores were calculated through a proprietary formula that weighs consumer ratings on multiple perceptual brand attributes (for details, see Mizik & Jacobson, 2008).⁴ Following an established approach to reduce skewness (Shi, Sridhar, Grewal, & Lilien, 2017), we used the natural logarithm of the Brand Asset score as the dependent variable in our analyses.

As in prior research (Luffarelli et al., 2019; Luffarelli et al., 2022), we operationalized the independent variable *Exciting* as an average of consumers' responses on the items related to the exciting brand personality available in the BAV dataset ("daring," "trendy," "unique," "independent," and "up-to-date;" $\alpha = 0.67$; Aaker, 1997). We also constructed variables capturing the other four brand personalities: *Sincere* (average of "friendly," "original," and "down-to-earth;" $\alpha = 0.76$); *Competent* (average of "reliable," "intelligent," and "leader;" $\alpha = 0.67$); *Sophisticated* (average of "upper-class," "glamorous," and "charming;" $\alpha = 0.68$); and *Rugged* (average of "rugged" and "tough;" $\alpha = 0.87$).

The independent variable *MS* was a dummy variable representing pre-shock quarters in which data were collected prior to 9/11 ($MS = 0$; assigned to the data collected in the 1st, 2nd, and 3rd quarters of 2001) versus post-shock quarters of increased MS, in which data were collected after 9/11 ($MS = 1$; assigned to the data collected in the 4th quarter of 2001, and 1st and 2nd quarters of 2002).

Finally, we included a set of control variables. First, we controlled for the effects of the other four brand personalities (*Sincere*, *Competent*, *Sophisticated*, and *Rugged*) to isolate the effects of the exciting brand personality from the effects of these other brand personalities. Second, as in prior research (Luffarelli et al., 2019), we controlled for brand awareness (number of respondents who were familiar with a brand), and brand usage and purchase behavior (total percentage of respondents who used or purchased a brand). Third, we controlled for whether brands had 6 quarters of non-missing data by including a dummy variable *Balanced* ("1" = no missing observations; and "0" = at least one missing observation). This is because brands that were not followed throughout all 6 quarters (i.e., those with missing data) may be different from those followed throughout all 6 quarters.⁵ Finally, we included product and service category fixed effects because a Hausman specification test for random versus fixed effects indicated that the latter was the preferred model (Hausman specification test, $\chi^2 = 212.06$, $p < .001$).

3.3. Method

We estimated a difference-in-differences model (DD), which is widely used in marketing research (e.g., Eggert, Steinhoff, & Witte, 2019; Janakiraman, Lim, & Rishika, 2018; Osinga, Zevenbergen, & van Zuijlen, 2019; Shi et al., 2017). DD approximates a natural experiment by comparing the differences in the outcomes of a "treated" group and a "control" group before and after an exogenous shock ("treatment"). Thus, this method helps establish causal effects of the shock on the outcomes of a treated group (Janakiraman et al., 2018; Shi et al., 2017).

Prior research has shown that 9/11 induced MS (Ferraro et al., 2005; Landau et al., 2004; Pyszczynski et al., 2006). We hence used this major deadly event as an exogenous, MS-inducing shock in our DD analysis (operationalized by the independent variable *MS*). It is important to note that 9/11 was exogenous to consumers' perceptions and evaluations of brands, because companies and consumers were unlikely to be able to anticipate 9/11. That is, firms were unlikely to adjust their advertising and branding strategies, and consumers their brand evaluations, in anticipation of the event.

Following prior research (Acemoglu, Autor, & Lyle, 2004; Dabalén & Paul, 2014; Duflo, 2001), we defined the treated and control groups in terms of intensity of the exciting brand personality (operationalized as the independent variable *Exciting*). This measurement captured continuous instead of binary levels of treatment intensity (i.e., more and less treated observa-

³ Our dataset is unbalanced because data for some of the brands were not collected in all six quarters, and hence, some of the observations are missing. Table B1 in Appendix B lists the number of observations per quarter.

⁴ The BAV measure of CBBE includes three (out of 16) brand personality traits that overlap with our measurement of two brand personalities: an exciting trait "unique" and two traits of the competent personality, "leader" and "reliable." We report an additional analysis that addresses this issue in the Robustness checks sub-section.

⁵ We also conducted a robustness check, estimating our model on a balanced panel dataset (see Robustness checks sub-section).

tions, rather than a binary measurement of a treatment and a control group). Importantly, 9/11 did not affect the average level of the exciting personality ($\beta = -0.10$, $t = -1.50$, $p = .15$), and thus, pre- and post-9/11 differences in *Exciting* could not drive the results.

The causal effect of 9/11 on CBBE of exciting brands was estimated by the interaction of the independent variable *MS* that captured the effect of the MS-inducing event (i.e., before vs. after the event) and the independent variable *Exciting* that captured the effect of treatment intensity (i.e., higher vs. lower perceptions of the exciting brand personality). More formally, we estimated the following DD model:

$$(1) \text{Log}(CBBE)_{it} = \beta_0 + \beta_1 \text{Exciting}_{it} + \beta_2 MS_t + \beta_3 \text{Exciting}_{it} \times MS_t + \delta X_{it} + \varepsilon_{it},$$

where $\text{Log}(CBBE)_{it}$ was the natural logarithm of CBBE of brand i in quarter t , Exciting_{it} was the rating of exciting brand personality of brand i in quarter t , MS_t was the dummy variable indicating quarters before ($MS = 0$) and following ($MS = 1$) the exogenous shock of 9/11, δX_{it} was a vector of control variables that we detailed previously and their corresponding coefficients, and ε_{it} was a random error term.

3.4. Results of the difference-in-differences model

We first verified the parallel trends assumption that there should be no difference between outcome trends of a treated and a control group before the arrival of the shock (Chu, Chu, & Liu, 2020; Eggert et al., 2019; Janakiraman et al., 2018). In our research context, the parallel trends assumption was that the CBBE trends of brands rated as more exciting and of brands rated as less exciting did not differ in the period prior to 9/11. This assumption was satisfied in our data (for details, see Appendix B). We then tested our proposed effect by estimating the specified DD model (Equation 1). Specifically, we regressed the natural logarithm of CBBE on *Exciting*, *MS*, and, most importantly, the *Exciting* \times *MS* interaction, along with the control variables. A significant negative *Exciting* \times *MS* interaction would provide support for a negative effect of 9/11 on CBBE of exciting brands.

As shown in Table 1, a negative and significant *Exciting* \times *MS* interaction ($\beta = -0.01$, $t = -2.81$, $p = .009$) was found. Thus, supporting our core proposition, the MS-inducing, exogenous shock of 9/11 influenced the CBBE of more exciting brands more negatively than the CBBE of less exciting brands.

To explore the impact of 9/11 on the exciting brands in more details, we conducted a floodlight analysis to dissect the effect of *MS* on CBBE across the range of *Exciting* values in our dataset (Spiller, Fitzsimons, Lynch, & McClelland, 2013). This analysis examined all the values of the independent variable, *Exciting*, and identified the regions where the effect of *MS* was significant. The analysis revealed that the effect of *MS* became negative and significant when brands were rated above 14.2 on the exciting personality measure ($\beta = -0.042$, $z = -1.96$, $p = .05$; examples include NASCAR, Pringles, and Sony PlayStation). In contrast, for brands rated below 5.12 on the exciting personality measure, *MS* had a significant positive effect ($\beta = 0.05$, $z = 1.96$, $p = .05$; examples include Actimel, Novartis, and Corn Flakes) (see Fig. 1).

3.5. The detrimental effect of MS is unique to exciting brands

We next examined whether the MS-inducing event of 9/11 influenced the CBBE of brands with other personalities. Specifically, we regressed CBBE on a set of quarterly dummy variables that were interacted with *Sincere*, *Competent*, *Sophisticated*, and *Rugged*. We also included in this model a set of quarterly dummy variables interacted with *Exciting* to test whether our main results were robust when interactions with the other four brand personalities were taken into account. Table 2 summarizes the results of this analysis.

First, the results of our main model for the exciting personality were replicated. While there was no change in the difference of CBBE of the more exciting as compared to less exciting brands before 9/11, we observed a significant decrease in the 4th quarter of 2001—right after 9/11 ($\beta = -0.01$, $t = -2.17$, $p = .04$). Second, there was no significant effect of the exogenous shock on CBBE of the sincere ($p = .72$), competent ($p = .32$), sophisticated ($p = .70$), or rugged brands ($p = .13$; see Table 2). Thus, further supporting our proposition, the detrimental effect of *MS* was specific to brands with an exciting personality, and did not affect brands with other personalities.

3.6. Robustness checks

We performed several checks to ensure that our main results were robust. First, the raw BAV measures of CBBE include three terms that are associated with the exciting (“unique”) and competent (“leader” and “reliable”) brand personalities, and are used for calculation of these personalities. Following prior research, we examined whether our results were driven by this measurement feature (for examples, see Batra et al., 2017; Datta et al., 2017; Heitmann et al., 2020). Specifically, we recalculated the CBBE measure after excluding the three brand personality traits. The adjusted measure correlated strongly with the original, unadjusted BAV measure ($r = 0.94$, $p < .001$). Analyses using this adjusted measure as the dependent variable yielded the same pattern of results as our main model (see Table B3 in Appendix B for details).

Table 1
Study 1: Results of the difference-in-differences model

	DV: Log(CBBE)	
	β	SE
<i>Exciting</i>	0.084****	0.007
<i>MS</i>	0.099*	0.040
<i>Exciting</i> × <i>MS</i>	-0.010**	0.004
<i>Sincere</i>	0.030****	0.004
<i>Competent</i>	0.095****	0.008
<i>Sophisticated</i>	0.030****	0.005
<i>Rugged</i>	0.014****	0.004
Brand awareness	0.001****	0.0001
Brand usage	0.022****	0.002
Balanced	0.117*	0.049
Product and service category fixed effects	Yes	
R ²	0.81	
N	11,711	

Notes: DV = Dependent variable. Fixed effects regression with robust standard errors clustered by product and service category. The focal variable of interest and its statistically significant coefficient estimate (i.e., DD estimate) are highlighted in boldface.
* $p < .05$, ** $p < .01$, *** $p < .005$, **** $p < .001$.

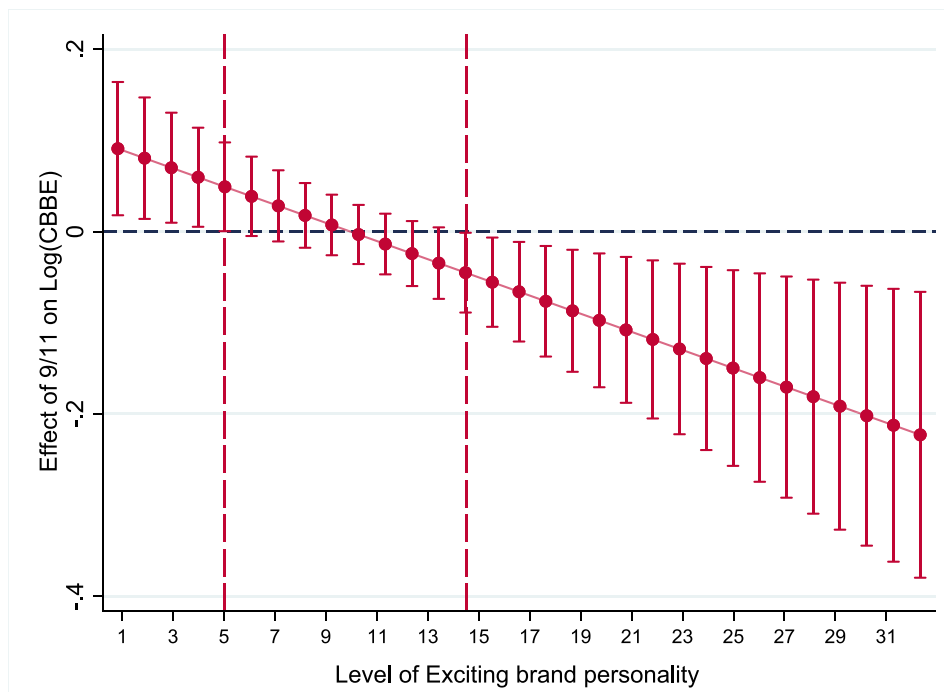


Fig. 1. Study 1: Impact of 9/11 on CBBE across levels of exciting brand personality. Fig. 1 shows the effect of MS on CBBE (y-axis) against the observed values of the exciting brand personality in our dataset (x-axis). On the left-hand side of the figure, MS has a positive effect on CBBE of brands with an exciting brand personality rating between 0.83 and 5.12 (i.e., 95% confidence intervals for the beta coefficients are above the horizontal reference '0' line). In the middle of the figure, MS has no statistically significant effect on CBBE of brands with an exciting brand personality rating between 5.13 and 14.20 (i.e., 95% confidence intervals for the beta coefficients cross the horizontal reference '0' line). On the right-hand side of the figure, MS has a negative effect on CBBE of brands with an exciting brand personality rating between 14.21 and 33.01 (i.e., 95% confidence intervals for the beta coefficients are below the horizontal reference '0' line).

Second, we re-estimated our DD model on the balanced dataset by excluding all brands for which we did not have full information over 6 quarters. The results were similar to the findings of the main model (see Table B4 in Appendix B for details).

Third, we explored whether our results were robust with respect to potential outliers. It might be that CBBE of some observations could substantively deviate from the mean levels in our dataset, biasing the overall pattern of results. To inves-

Table 2
Study 1: The effect is observed only for exciting but not other brands.

	DV: Log(CBBE)	
	β	SE
<i>Exciting</i>	0.082****	0.007
<i>Exciting</i> × 2001 Q1	−0.001	0.004
<i>Exciting</i> × 2001 Q2	0.001	0.004
Exciting × 2001 Q4	−0.008*	0.004
<i>Exciting</i> × 2002 Q1	0.001	0.004
<i>Exciting</i> × 2002 Q2	−0.008	0.006
<i>Sincere</i>	0.030****	0.005
<i>Sincere</i> × 2001 Q1	0.002	0.003
<i>Sincere</i> × 2001 Q2	−0.003	0.003
Sincere × 2001 Q4	0.001	0.002
<i>Sincere</i> × 2002 Q1	−0.001	0.002
<i>Sincere</i> × 2002 Q2	−0.002	0.003
<i>Competent</i>	0.093****	0.007
<i>Competent</i> × 2001 Q1	0.005	0.005
<i>Competent</i> × 2001 Q2	0.013**	0.004
Competent × 2001 Q4	−0.004	0.004
<i>Competent</i> × 2002 Q1	−0.001	0.003
<i>Competent</i> × 2002 Q2	−0.002	0.004
<i>Sophisticated</i>	0.031****	0.004
<i>Sophisticated</i> × 2001 Q1	−0.001	0.003
<i>Sophisticated</i> × 2001 Q2	0.001	0.002
Sophisticated × 2001 Q4	−0.001	0.002
<i>Sophisticated</i> × 2002 Q1	−0.009*	0.003
<i>Sophisticated</i> × 2002 Q2	−0.001	0.004
<i>Rugged</i>	0.018****	0.004
<i>Rugged</i> × 2001 Q1	−0.004†	0.002
<i>Rugged</i> × 2001 Q2	−0.005*	0.002
Rugged × 2001 Q4	−0.003	0.002
<i>Rugged</i> × 2002 Q1	−0.007****	0.001
<i>Rugged</i> × 2002 Q2	−0.005*	0.002
Quarter fixed effects	Yes	
Product and service category fixed effects	Yes	
Control variables	Yes	
R ²	0.81	
N	11,711	

Notes: DV = Dependent variable.

Fixed effects regression with robust standard errors clustered by product and service category. The 3rd quarter of 2001 is the base category. The focal variables of interest are highlighted in boldface. The variables that test the parallel trends assumption are highlighted in italics. The parallel trends assumption is satisfied for *Exciting*, *Sincere*, and *Sophisticated* brand personalities because their CBBE did not change prior to 9/11 (i.e., *Exciting*, *Sincere*, and *Sophisticated* interactions with pre-9/11 quarters 2001Q1 and 2001Q2 are not statistically different from interactions with pre-9/11 quarter 2001Q3). The parallel trends assumption is not satisfied for *Competent* and *Rugged* brand personalities because their CBBE changed prior to 9/11 (i.e., for *Competent*, CBBE in 2001Q2 is statistically different from CBBE in 2001Q3; for *Rugged*, CBBE in 2001Q1 and 2001Q2 are statistically different from CBBE in 2001Q3).

† $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .005$, **** $p < .001$.

tigate this possibility, we winsorized our dependent variable at the 1st and 99th percentiles. The results replicated the findings of our main model (see Table B5 in Appendix B for details).

Fourth, it might be that brands with abnormal exciting personality levels drove our results. We investigated this by repeating our main analysis with the independent variable *Exciting* winsorized at the 1st and 99th percentiles. The results of this analysis were consistent with the findings of our main model (see Table B5 in Appendix B for details).

Fifth, to help validate our identification of 9/11 as the exogenous shock that triggered the detrimental effect of MS, we conducted a “placebo” event regression test (Eggert et al., 2019; Janakiraman et al., 2018). For this test, we specified a placebo event that occurred a year after 9/11, as a cutoff separating the pre- and post-shock time periods. We compared CBBE of exciting brands in the placebo pre-shock period (1st, 2nd, and 3rd quarters of 2002) and the placebo post-shock period (4th quarter of 2002, and 1st and 2nd quarters of 2003).⁶ Because in 2002, one year after 9/11, no deadly events of a comparable

⁶ For this analysis, we used BAV data collected in the 1st, 2nd, 3rd and 4th quarters of 2002, and the 1st and 2nd quarters of 2003.

scale occurred in the U.S., American consumers should not have experienced MS to the same degree. We repeated our main analysis using this specification. As expected, we did not find evidence for the negative effect of the placebo shock in this regression test (see [Table B6 in Appendix B](#) for details). This analysis therefore provided additional evidence that the pattern of our results cannot be simply attributed to factors such as seasonality.

Sixth, although prior studies established that reminding consumers of 9/11 induces MS ([Ferraro et al., 2005](#); [Landau et al., 2004](#); [Pyszczynski et al., 2006](#)), it might be argued that factors other than MS could have impacted our results. One such factor could be an elevated sense of uncertainty. Hence, we sought to explore whether similar effects could be observed for an event associated with substantial uncertainty but not with MS. For this test, we specified a “financial uncertainty” event—the crash of the financial firm Lehman Brothers that triggered the Global Financial Crisis of 2008. We compared CBBE of exciting brands before the Lehman Brothers bankruptcy (1st, 2nd, and 3rd quarters of 2008) and after it (4th quarter of 2008, and 1st and 2nd quarters of 2009).⁷ Repeating our main analysis with this specification did not yield a negative effect of the shock on CBBE of exciting brands (see [Table B7 in Appendix B](#) for details). These results thus further supported our proposition that the effect is specific to MS-inducing events and not to events that elevated a sense of uncertainty.

Overall, the findings of Study 1 provided evidence for the proposed detrimental effect of MS on brands with an exciting but not other personality and highlighted the impact on real-world brands across a wide spectrum of product and service categories. Our results also held after controlling for consumers’ familiarity with the brand, as well as prior purchase and usage experience with the brand. We note that the size of the effect of MS on the evaluations of exciting brands was small; however, given the relatively noisy nature of the secondary data, the estimates were still sizable and practically important (e.g., our floodlight analysis indicated that an exciting brand can experience between 5% and 23% reduction in CBBE following an MS-inducing event). Nevertheless, Study 1 has potential limitations, stemming from our operationalization of MS using a real-life event. We sought to address many of these limitations through a series of robustness checks. Furthermore, we directly manipulated MS in a controlled experimental setting in subsequent studies.

4. Study 2: Experimental evidence for the effect

Whereas Study 1 established the detrimental effect of MS on the evaluations of exciting (vs. other) brands using secondary data, Study 2 sought to provide causal evidence for the proposed effect in a controlled experimental setting.⁸

4.1. Design and procedure

Three hundred and forty-four U.S. consumers ($M_{\text{age}} = 37$ years⁹; 55% women) recruited from a consumer panel were randomly assigned according to a 2 (MS vs. control) \times 2 (exciting vs. sincere brand personality) between-participants design.

Participants first completed an established MS manipulation ([Florian et al., 2002](#)). Those in the MS (vs. control) condition were asked to write down their thoughts about their own death (vs. watching television). Following an established practice in MS literature ([Greenberg et al., 1997](#); [Ferraro et al., 2005](#); [Huang et al., 2018](#)), participants completed a filler task (comprised of the PANAS measures [[Watson, Clark, & Tellegen, 1988](#)] and an arousal measure [[Russell, Weiss, & Mendelsohn, 1989](#)]) before responding to the dependent measures. Of these filler measures, only the negative component of PANAS differed across conditions. However, including the measures of negative affect, positive affect, and arousal (both individually and together) in the analyses reported below did not change the pattern of results (see [Appendix C](#) for details).

In an ostensibly unrelated third task, participants read a short description of a brand from a common product category: apparel. Following prior research ([Aaker et al., 2004](#); [Luffarelli et al., 2019](#)), the description was manipulated to project either an exciting or sincere brand personality. We opted to use another brand personality as a control instead of a brand with a non-exciting personality (i.e., a brand low on perceptions of excitement, with no reference to any of the other four personalities) to avoid confounding a low excitement brand with a brand without any personality. Specifically, we used the sincere brand personality in the control condition. Note that the exciting and sincere personalities are two of the most prevalent personalities in the marketplace ([Sundar & Noseworthy, 2016](#)) and this pair of personalities has been used extensively in prior brand personality research ([Aaker et al., 2004](#); [Luffarelli et al., 2019](#)).

The exciting (vs. sincere) version of the description characterized the brand as “cool,” “daring,” and “unique” (vs. “small-town,” “sentimental,” and “honest;” [Aaker, 1997](#); see [Appendix C](#)). A pretest with participants from the same population as the main study confirmed that the two versions of the description differed as expected in terms of brand personality, but they did not differ in other dimensions such as likability or quality (see [Appendix C](#)). As the dependent measure, participants rated the apparel brand on three scale items (1 = “Very unfavorable / negative / bad,” and 7 = “Very favorable / positive / good”). We averaged these items into a single brand evaluation measure for analyses ($\alpha = 0.94$). Finally, participants responded to the basic demographic measures and an attention check ([Pennycook, Cannon, & Rand, 2018](#)). The responses of twenty-nine participants who failed the attention check were removed from subsequent analyses. (Including these responses in the analysis yielded a similar pattern of results.)

⁷ For this analysis, we used BAV datasets collected in the 1st, 2nd, 3rd and 4th quarters of 2008, and the 1st and 2nd quarters of 2009.

⁸ The data for the experimental studies can be obtained from the corresponding author upon request.

⁹ Research has shown that a person’s age may moderate the effects of MS ([Chopik, 2017](#)). In this, and all other experimental studies, participants’ age did not significantly impact our results (see [Appendices C-G](#) for details).

4.2. Results

A 2×2 ANOVA on brand evaluation with the MS condition (MS vs. control) and brand personality (exciting vs. sincere) as between-participants factors revealed a significant main effect of brand personality ($F(1, 311) = 9.70, p = .002, \eta_p^2 = 0.03$). Compared to those in the sincere brand personality condition ($M_{\text{sincere}} = 5.06, SD_{\text{sincere}} = 1.27$), participants in the exciting personality condition evaluated the brand less favorably ($M_{\text{exciting}} = 4.58, SD_{\text{exciting}} = 1.32$). The main effect of MS was not significant ($p = .43$). Importantly, the two-way interaction was significant ($F(1, 311) = 8.00, p = .005, \eta_p^2 = 0.03$). Consistent with the proposed effect, participants in the MS condition evaluated the exciting brand significantly less favorably ($M_{\text{MS_exciting}} = 4.35, SD_{\text{MS_exciting}} = 1.31$) than those in the control condition ($M_{\text{control_exciting}} = 4.88, SD_{\text{control_exciting}} = 1.29$; $F(1, 311) = 6.66, p = .01, \eta_p^2 = 0.02$). In contrast, MS did not significantly alter participants' evaluations of the sincere brand ($M_{\text{control_Sincere}} = 4.92, SD_{\text{control_sincere}} = 1.25$ vs. $M_{\text{MS_sincere}} = 5.22, SD_{\text{MS_sincere}} = 1.29$; $p > .16$). Furthermore, in the MS conditions, participants' evaluations of the exciting brand were significantly less favorable than those of the sincere brand ($F(1, 311) = 18.61, p < .001, \eta_p^2 = 0.06$). In the control conditions, however, this pattern was not found ($p > .84$).

Overall, Study 2 provided support for the detrimental effect of MS in a controlled experimental setting, causally demonstrating that MS can decrease the evaluations of brands with an exciting personality but not brands with another personality.

5. Study 3: Perceptions of exciting brand's change moderate the effect

Using a process-by-moderation approach (Spencer, Zanna, & Fong, 2005), Study 3 further examined the underlying mechanism of the detrimental effect of MS on evaluations of exciting brands. Specifically, we experimentally manipulated the extent to which the notion of change is associated with an exciting brand. To further demonstrate generalizability, we used a different context for MS induction (i.e., making the deadly impact of a war salient). Lastly, we utilized a non-profit brand, and assessed whether our proposed effect holds for both for-profit (e.g., an apparel firm in Study 2) and for non-profit brands (e.g., a charity in the current study).

5.1. Design and procedure

Two hundred and fifty-one European consumers ($M_{\text{age}} = 30$ years; 43% women) recruited from a consumer panel were randomly assigned according to a 2 (MS vs. control) $\times 2$ (frequent vs. infrequent change) between-participants design.

We manipulated MS by changing the order in which participants completed experimental tasks. Participants in the MS condition started the study with a "current event" task. They were asked to write about how a war could fatally impact them (see Appendix D for details). As in Study 2, participants also completed a filler task: They responded to measures on sensation seeking (Hoyle, Stephenson, Palmgreen, Lorch, & Donohew, 2002). (Responses on these measures did not differ between the experimental conditions; including them in the analyses as covariates did not change any of the results reported below; see Appendix D for details.) Thereafter, participants proceeded to the final task in which they read about a charity organization with an exciting brand personality. The description embedded exciting brand personality traits that fit the target category (e.g., "unique;" Aaker, 1997; see Appendix D for details). To manipulate the extent to which the notion of change was associated with the exciting brand, we presented participants with two versions of the exciting brand's product offering. We focused on the product offering because Pilot Study 1 showed that consumers perceived exciting brands as changing their product offerings frequently (see Appendix A1 for details). All participants read that the charity organization ran three campaigns this year, in which each donor received a gift for their contributions. Participants in the infrequent change condition saw that the same gift was offered in all three campaigns. That is, there was no change in the gift that the charity organization offered. In contrast, participants in the frequent change condition saw a different gift for each of the campaigns (see Appendix D for details). That is, the gift offered changed across the campaigns. A manipulation check confirmed that the two versions of the scenario differed as expected in terms of the strength of perceptions of change ("This non-profit changes its campaigns," 1 = "Strongly disagree," and 7 = "Strongly agree;" $M_{\text{frequent}} = 3.37, SD_{\text{frequent}} = 1.82$ vs. $M_{\text{infrequent}} = 2.10, SD_{\text{infrequent}} = 1.53, t(249) = 6.02, p < .001, \text{Cohen's } d = 0.76$). As the dependent measure, participants rated the brand on three scale items (1 = "Negative/unfavorable/bad," and 7 = "Positive/favorable/good").

Participants in the control condition first completed the brand evaluation measures and the manipulation check, and then the "current event" task and the sensation seeking measures. Finally, participants in both conditions responded to the basic demographic measures. Participants' responses to the scale items for brand evaluation were averaged into a single measure for analyses ($\alpha = 0.87$).

5.2. Results

A 2×2 ANOVA on brand evaluation with the MS condition (MS vs. control) and perceptions of change (frequent vs. infrequent) as between-participants factors, revealed no significant main effects ($ps > 0.74$). Importantly, consistent with our proposition, the two-way interaction was significant ($F(1, 247) = 12.99, p < .001, \eta_p^2 = 0.05$; see Fig. 2). In the frequent change

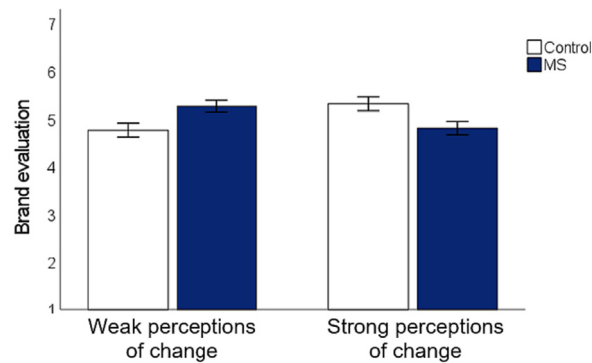


Fig. 2. Study 3: Perceptions of change moderated the detrimental effect of MS on the exciting brand—evaluations of the exciting brand decreased (vs. increased) under MS, when perceptions of change were strong (vs. weak). Note: Error bars represent standard errors.

condition, MS significantly decreased the exciting brand's evaluation ($M_{\text{control_frequent}} = 5.33$, $SD_{\text{control_frequent}} = 1.18$ vs. $M_{\text{MS_frequent}} = 4.82$, $SD_{\text{MS_frequent}} = 1.08$; $F(1, 247) = 6.62$, $p = .011$, $\eta_p^2 = 0.03$). In contrast, in the infrequent change condition, MS increased the evaluation of the exciting brand ($M_{\text{MS_infrequent}} = 5.28$, $SD_{\text{MS_infrequent}} = 0.98$ vs. $M_{\text{control_infrequent}} = 4.78$, $SD_{\text{control_infrequent}} = 1.19$; $F(1, 247) = 6.38$, $p = .012$, $\eta_p^2 = 0.03$). Furthermore, when mortality was salient, the exciting brand was evaluated significantly less favorably in the frequent than in the infrequent change condition ($F(1, 247) = 5.14$, $p = .024$, $\eta_p^2 = 0.02$). The opposite pattern was found in the control condition ($F(1, 247) = 8.09$, $p = .005$, $\eta_p^2 = 0.03$).

Overall, the results of Study 3 offered initial support for a change-avoidance based mechanism by directly manipulating the extent to which an exciting brand is associated with the notion of change. In addition, this study demonstrated a means through which firms can address the detrimental effect of MS on exciting brands: adjusting marketing activities, such as the frequency at which new product offerings are introduced, to temporarily reduce a brand's association with the notion of change.¹⁰

6. Studies 4a-4b: The mediating role of change-avoidance tendency

Extending the findings of Study 3, Studies 4a-4b directly examined whether consumers' change-avoidance tendency can mediate our proposed effect. These studies also utilized the context of the COVID-19 pandemic as an MS-inducing event.

6.1. Study 4a: Lab

Study 4a aimed to test whether consumers' change-avoidance tendency underlies the proposed detrimental effect of MS on the evaluations of exciting (vs. other) brands.

6.1.1. Study 4a: Design and procedure

Ninety-one graduate students ($M_{\text{age}} = 23$ years; 50% women) from a major European university participated in this lab study in exchange for course credit. The study was conducted during the last week of February 2020, when the COVID-19 outbreak was widely recognized as a deadly threat, but the virus was not yet widespread in the area.

Participants were randomly assigned to one of the two conditions (MS vs. control) in a between-participants design. As in Study 3, we manipulated MS by changing the order in which participants completed experimental tasks. Participants in the MS condition started the study with a "current event" task. They were asked to write about how the coronavirus could fatally impact them (see Appendix F for details). As in Studies 2 and 3, participants also completed a filler task: they responded to measures on stress (Durante & Laran, 2016) and arousal (Russell et al., 1989). (Responses on these measures did not differ between the experimental conditions; including them in the analyses as covariates did not change any of the results reported below; see Appendix F.) Thereafter, participants completed a brand evaluation measure and mediation measures as a part of a third, ostensibly unrelated task. Participants in the control condition first completed the brand evaluation measure and mediation measures, and then the "current event" task and the arousal and stress measures. In both conditions, participants also responded to basic demographics measures.

¹⁰ A replication study that directly manipulated the strength of exciting brand's association with the notion of change through an advertising tagline showed similar results (see Appendix E for details).

The description of the exciting brand was the same as that in Study 2. As a measure of brand evaluation, participants rated how much they liked the brand (1 = “Not at all,” 7 = “Quite a lot”). Participants also completed mediation measures pertaining to the change-avoidance tendency (“I like brands that offer something new every time” and “I prefer brands that are more dynamic than stable,” 1 = “Strongly disagree,” 7 = “Strongly agree”). We reverse-coded these items (such that higher scores indicated increased change-avoidance tendency) and averaged them into a single measure ($r = 0.56$) for subsequent analysis.¹¹

6.1.2. Study 4a: Results

Consistent with the proposed effect, participants in the MS condition evaluated the exciting brand significantly less favorably than those in the control condition ($M_{MS} = 3.87$, $SD_{MS} = 1.60$ vs. $M_{control} = 4.56$, $SD_{control} = 1.31$; $t(89) = -2.24$, $p = .03$, Cohen's $d = -0.47$). Moreover, supporting our proposed mechanism, participants in the MS condition exhibited stronger tendency to avoid experiencing change than those in the control condition ($M_{MS} = 3.46$, $SD_{MS} = 1.40$ vs. $M_{control} = 2.73$, $SD_{control} = 1.23$; $t(89) = 2.63$, $p = .01$, Cohen's $d = 0.55$).

The average variance extracted (AVE) for our mediation measure (AVE = 0.78) exceeded the squared correlation between the mediator and the dependent variable ($r = 0.22$), demonstrating discriminant validity and indicating that the dependent variable is distinct from the mediator (Fornell & Larcker, 1981).

We conducted a mediation analysis (Model 4; 5000 resamples; Hayes, 2017) with the MS condition (MS vs. control) as the independent variable, change-avoidance tendency as the mediator, and brand evaluation as the dependent variable. MS had a significant effect on the tendency to avoid experiencing change ($\beta = 0.72$, $SE = 0.27$, $t(89) = 2.66$, $p = .01$), which in turn had a significant effect on brand evaluation ($\beta = -0.49$, $SE = 0.10$, $t(88) = -4.73$, $p < .001$). The indirect effect of MS on brand evaluation through the tendency to avoid change was negative and significant (95% CI = [-0.68, -0.08]). After this indirect effect was controlled for, the direct effect of MS on the evaluation of the exciting brand was no longer significant ($\beta = -0.33$, $SE = 0.28$; $t(88) = -1.20$, $p = .24$; 95% CI = [-0.89, 0.22]). These results thus supported our proposed mechanism.

Although Study 4a demonstrated the negative effect of MS and the underlying process in a controlled laboratory environment, it had limitations. Specifically, due to the size of the available participant pool, Study 4a utilized only two experimental conditions and did not include a control brand personality for comparison with the exciting brand. Study 4b addressed this limitation by using a fuller design and by testing whether MS negatively impacts brands with an exciting but not other personality and whether change-avoidance tendency mediates the effect.

6.2. Study 4b: Consumer panel

Study 4b extended the results of Study 4a in several ways. First, Study 4b examined the mediating role of consumers' change-avoidance tendency in a fully crossed 2×2 design. Whereas Study 2 used a sincere brand personality as the control, Study 4b utilized a sophisticated brand personality in the control condition to further demonstrate robustness. Second, we utilized a different operationalization of a change-avoidance tendency that directly reflected consumers' motivational state. Lastly, we explored whether the connection between exciting brands and consumer self-concept can impact our results.

6.2.1. Study 4b: Design and procedure

Five hundred and fifty-eight U.S. consumers ($M_{age} = 38$ years; 48% women) recruited from a consumer panel were randomly assigned according to a 2 (MS vs. control) \times 2 (exciting vs. sophisticated brand personality) between-participants design.

Participants first completed an MS manipulation similar to the one used in Study 2. Those in the MS (vs. control) condition were asked to write down their thoughts about their own death from COVID-19 (vs. watching television; see Appendix G). Thereafter, participants responded to three measures on change-avoidance tendency (“At this moment, to what extent do you feel you want to stay away from change,” “At this moment, to what extent do you feel that changes are positive” (reverse-coded), and “At this moment, how interested are you in keeping things as they are right now,” 1 = “Not at all,” 7 = “Extremely”). We averaged these items into a single measure for subsequent analysis ($\alpha = 0.62$). In addition, participants completed a manipulation check for the MS induction procedure (“My thoughts focused on my own mortality” and “My thoughts were about the inevitability of death,” $r = 0.72$, averaged into a single measure for analysis). An independent samples t -test on manipulation check measure with MS (vs. control) condition as a between-participants factor confirmed that our manipulation successfully induced MS ($M_{MS} = 4.74$, $SD_{MS} = 1.48$ vs. $M_{control} = 1.98$, $SD_{control} = 1.47$, $t(556) = 22.09$, $p < .001$, Cohen's $d = 1.87$).

In an ostensibly unrelated second task, participants read a short description of a brand of hand creams. The exciting (vs. sophisticated) version of the description characterized the brand as “bright,” “effervescent,” and “cheerful” (vs. “dainty,” “subtle,” and “tasteful”) and presented three sample products (see Appendix G). A manipulation check confirmed that our brand personality manipulation worked as intended (“Sometimes people talk about brands as if they have human-like char-

¹¹ Using these items individually produced similar pattern of results.

acteristics or ‘a personality’. Do you feel that the brand has an exciting or a sophisticated personality?” 1 = “Definitely exciting,” and 7 = “Definitely sophisticated;” $M_{exciting} = 4.48, SD_{exciting} = 1.49$ vs. $M_{sophisticated} = 5.54, SD_{sophisticated} = 1.31, t(556) = -8.94, p < .001$, Cohen’s $d = -0.76$). As in Study 4a, participants rated how much they liked the brand (1 = “Not at all,” 7 = “Very much”), which served as our dependent measure. Lastly, to explore whether the connection between exciting brands and consumer self-concept can impact our results, we asked participants to complete a self-brand connection (SBC) measure (Escalas & Bettman, 2005) that was adapted to be about exciting brands ($\alpha = 0.97$; see Appendix G). At the end of the study, participants responded to basic demographic measures as in Study 4a.

6.2.2. Study 4b: Results

A 2×2 ANOVA on brand evaluation with the MS condition (MS vs. control) and brand personality (exciting vs. sophisticated) as between-participants factors revealed no significant main effects ($ps > 0.11$). Importantly, the two-way interaction was significant ($F(1, 554) = 4.45, p = .035, \eta_p^2 = 0.008$). Consistent with the proposed effect, participants in the MS condition evaluated the exciting brand significantly less favorably ($M_{MS_exciting} = 3.90, SD_{MS_exciting} = 1.41$) than those in the control condition ($M_{control_exciting} = 4.35, SD_{control_exciting} = 1.41; F(1, 554) = 6.88, p = .01, \eta_p^2 = 0.003$). In contrast, MS did not significantly alter participants’ evaluations of the sophisticated brand ($M_{MS_sophisticated} = 4.13, SD_{MS_sophisticated} = 1.43$ vs. $M_{control_sophisticated} = 4.07, SD_{control_sophisticated} = 1.53; p > .72$).

We conducted a moderated mediation analysis (Model 15; 5,000 resamples; Hayes, 2017) with the MS condition (MS vs. control) as the independent variable, change-avoidance tendency as the mediator, brand personality (exciting vs. sophisticated) as the moderator, and brand evaluation as the dependent variable (see Fig. 3).

This analysis revealed a significant effect of MS on participants’ change-avoidance tendency ($\beta = 0.27, SE = 0.09, t(556) = 3.13, p = .002$), and a significant change-avoidance \times brand personality interaction on brand evaluation ($\beta = -0.26, SE = 0.13, t(552) = -2.03, p = .043$). The index of moderated mediation was significant (95% CI = $[-0.173, -0.003]$). Supporting our propositions, change-avoidance tendency mediated the effect of MS on evaluations of the exciting brand (conditional indirect effect: $\beta = -0.06, SE = 0.03, 95\% CI = [-0.13, -0.01]$) but not on evaluations of the sophisticated brand (conditional indirect effect: $\beta = 0.01, SE = 0.03, 95\% CI = [-0.05, 0.07]$).

To investigate whether the connection between exciting brands and consumer self-concept might moderate our proposed effect, we included SBC as a second moderator in the analysis reported above (Model 17; 5000 resamples; Hayes, 2017). This analysis showed that the index of moderated mediation for brand personality as a moderator remained significant (95% CI = $[-0.17, -0.02]$). However, the index of moderated mediation for SBC as a moderator was not significant (95% CI = $[-0.02, 0.01]$). Moreover, both interaction effects with SBC as a moderator were not significant (MS \times SBC: $p = .57$, and Change-avoidance \times SBC: $p = .69$). These results suggest that consumers’ existing preference for exciting brands did not impact our results.

Overall, Studies 4a-4b provided convergent support for the mediating role of change-avoidance tendency in our proposed effect.

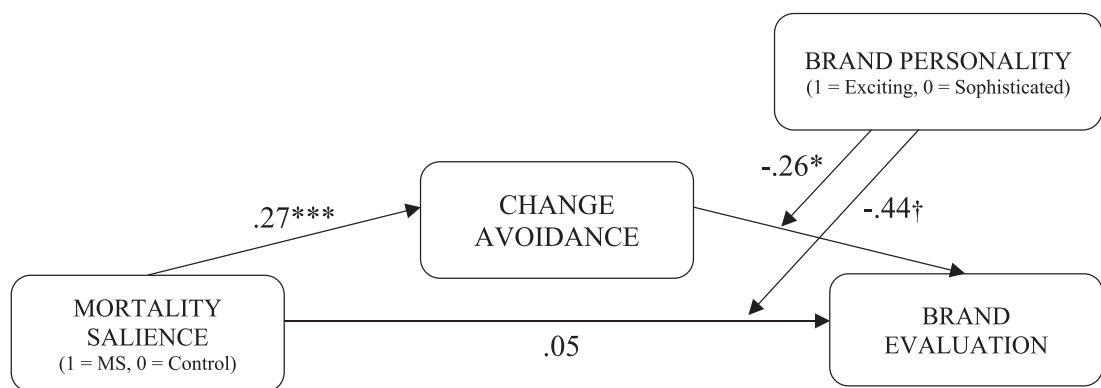


Fig. 3. Study 4b: Change-avoidance tendency mediated the negative effect of MS on evaluations of the exciting brand, but not of the sophisticated brand. † $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.

7. General discussion

This research investigates how mortality salience (MS) may impact brand evaluations. Through analyses of large-scale secondary data and multiple experiments, we show that MS is likely to decrease evaluations of brands with an exciting but not other personality (Study 1 and Study 2). This occurs because exciting brands, unlike other brands, tend to hold stronger associations with the notion of change (Pilot Studies 1–2), and because MS increases consumers' tendency to avoid experiencing change (Studies 3, 4a–4b). We demonstrate the generalizability and robustness of this detrimental effect of MS and its real-world implications by using a large-scale dataset with thousands of brands from a wide variety of product and service categories. We use different operationalizations of MS (major terror attacks; experimental inductions of MS based on the general notion of death, based on the COVID-19 pandemic, and based on a war), and brand personality (across studies, we used the majority of exciting brand personality traits; Aaker, 1997). We also show that the negative effect of MS can occur for both for-profit (Study 2, Studies 4a–4b) and non-profit brands (Study 3). Overall, our multi-method studies provide robust evidence for an important effect of MS on brands.

7.1. Theoretical and practical contributions

This research contributes to literature in multiple ways. Our results add to the research on marketing implications of MS (Dunn et al., 2020; Ferraro et al., 2005; Huang & Wyer, 2015) by identifying a previously undocumented, detrimental effect of MS on brands and a change-avoidance based mechanism underlying this effect. Specifically, brands with an exciting (vs. other) personality are more closely associated with the notion of change and consumers perceive these brands to change their elements more frequently (e.g., a brand's product offering). Because MS can increase consumers' tendency to avoid experiencing change, when mortality is salient, consumers tend to evaluate exciting, but not other, brands less favorably. That is, MS can drive consumers to avoid the general notion of change, as for example reflected in an exciting brand personality, altering their responses to different brands. These findings add to the theories on how MS impacts consumer behavior.

This research also complements the literature on branding and brand personalities (Aaker, 1997; Aaker et al., 2004; Geuens et al., 2009; Malär et al., 2012). Our results highlight an important context in which consumers are likely to react less favorably toward exciting (vs. other) brands. This adds to the extant understanding of how different brand personalities may interact with contextual variables to influence consumer behavior and highlights avoidance of change as a potent underlying psychological driver. This finding is important because there is limited prior research on how exogenous market factors—some of the least researched but potentially impactful factors (Whitler et al., 2021)—may influence brands with different personalities.

Our findings offer important managerial insights. First, our research shows that exciting brands—highly popular and valuable brands in the market (Luffarelli et al., 2019; Luffarelli et al., 2022)—can experience degradation in evaluations when mortality-related events occur. Managers should take account of our findings when managing brands with an exciting personality. For example, they should consider planning for branding activities and allocating resources more optimally for consumer segments that may experience more exposures to MS-related events (e.g., exposures to deadly diseases or natural disasters, being geographically close to fatal incidents such as deadly shootings).

Second, our findings suggest the means through which brand managers can remedy the detrimental effect of MS. For example, managers can temporarily reduce the association between their exciting brand and the notion of change (e.g., reduce changes to brand elements, update advertising taglines to tone down a brand's association with the notion of change). Managers may also consider reducing or pausing promotion efforts that emphasize the exciting personality aspect of their brand, especially in media platforms that frequently feature death-related content or during periods when consumers are likely to be heavily exposed to MS-inducing information (e.g., immediately after major deadly events).

Third, our research shows that consumers' change-avoidance tendency underlies the negative effect of MS on the evaluations of exciting brands. Our findings suggest that practitioners can address the detrimental impact by helping consumers reduce their aversion to change due to the onset of MS. For instance, communications for exciting brands in innovation and technology sectors could reframe changes (e.g., continuous technological advancements) as the industry norm and the stable state for an innovative brand. To better inform segmentation and targeting, marketing research agencies could include consumers' change-avoidance tendency as a psychographic measure in their research effort.

7.2. Future research

7.2.1. Events that induce mortality salience

Consumers may experience MS in a variety of contexts (Ferraro et al., 2005; Gobrecht & Marchand, 2022). Thus, across our studies, we used different MS operationalizations (terror attacks in Study 1, a general reminder of the possibility of death in Study 2, a war in Study 3, and the COVID-19 pandemic in Studies 4a–4b) and found consistent results. These findings suggest that MS-inducing events of different nature can have an overall negative impact on evaluations of exciting brands.

Future research can examine how different types of MS-related events may have different effects on brands. For instance, while some MS-inducing events are specific to certain geographical regions (e.g., terror attacks), others present a global threat (e.g., pandemics). Further research can benefit from exploring whether the scope of event—local or global—can impact

brands with different personalities differently. Similarly, different MS-inducing events can be associated with different levels of perceived (and actual) control. For example, whereas consumers may perceive having some level of control in dealing with the potentially fatal threat of COVID-19 (e.g., wear masks, wash hands, avoid crowded places, vaccinate; Yang & Ma, 2020), terror attacks are typically beyond individuals' control. It is possible that having higher levels of perceived control during a life-threatening event can help reduce anxiety, attenuating negative effects of MS on brand evaluations. To illustrate, MS effects may be attenuated when its source is perceived to be more controllable (e.g., COVID-19 infection) and the means to control it is readily available (e.g., a face mask is within one's reach). Future research can explore these possibilities and uncover new insights.

7.2.2. Effects of uncertainty

Our results document how MS can lower brand evaluations. It might be that an elevated sense of uncertainty can also influence brand evaluations, as deadly threats may invoke uncertainty about the future (Hohman & Hogg, 2015). In our empirical work, we did not find that uncertainty per se is sufficient to produce the pattern of results we observed. To illustrate, in Study 1 we found that CBBE of exciting brands decreased following a deadly event (i.e., 9/11) but not following a financial uncertainty event (i.e., the fall of Lehman Brothers). These findings align with prior research that argues that effects of MS are independent of effects of uncertainty: Individuals are often motivated to avoid dying above all else because the threat of mortality can erode the rest of human desires (Greenberg & Arndt, 2012). Moreover, MS effects may be unique because the change (i.e., dying) is almost unequivocally negative, whereas uncertainty involves lacking knowledge of how events may turn out, which may or may not be negative. For instance, research has shown that individuals may prefer uncertain outcomes when they are in a loss domain (Kahneman & Tversky, 1979), when they want to avoid responsibility (Leonhardt, Keller, & Pechmann, 2011) or are simply curious (Van Dijk & Zeelenberg, 2007). Thus, in several common contexts uncertainty may encourage individuals to experience change rather than to avoid it. Nonetheless, the impact of uncertainty on brand evaluations presents an interesting direction for further inquiry. Future research thus can explore whether uncertainty involving strictly negative outcomes can produce effects similar to those we observe in our work.

7.2.3. Additional future research directions

Our findings suggest several additional future research directions. Consumption experiences tend to differ in consistency (e.g., consuming a standardized vs. non-standardized product) and hence may be associated with different perceptions of change. It could be interesting to investigate whether MS may exert a stronger impact on consumers' evaluations of more (vs. less) variable consumption experiences. The change-avoidance mechanism we uncovered in this research may also be applicable in other important contexts such as financial decision-making, information acquisition, or charitable donations. In the domain of financial decision-making, the onset of MS may influence consumers' evaluations of financial products that offer more stable (vs. more variable) returns. In the domain of information acquisition, prior research suggests that whether a set of information is perceived as stable (vs. expandable) can influence consumers' evaluations pertaining to the information (Yang, Carmon, Ariely, & Norton, 2019). Thus, the onset of MS may alter peoples' preferences for acquiring different types of information. In the domain of charitable donations, many non-profit organizations strive to bring about changes in contexts associated with the notion of death. In these situations, MS may affect donors' intentions to support different charitable causes. Future research should explore these important domains and yield new insights on the effects of MS. Moreover, our research findings suggest that consumers perceive exciting (vs. non-exciting) brands to be more likely to change their brand elements. Future research can explore whether this perception can benefit brands that operate in market sectors that are known for change, such as innovation-intensive industries.

Further, our research did not find evidence for the effects of MS on brands with other personalities. However, it is possible that MS could impact these brands under some conditions. Although we did not observe the effect of MS on non-exciting brands more generally, our research suggests that MS may increase consumer evaluations of brands closely associated with the notion of stability. For instance, in Study 1, we found that the least exciting brands—those most weakly associated with the notion of change—experienced an increase in CBBE following 9/11. Similarly, our Study 3 suggests that when an exciting brand makes fewer changes to its brand elements, its evaluations were higher under MS. Future research could explore whether a brand's association with the notion of stability can increase evaluations under MS. For instance, it would be interesting to analyze the popularity of nostalgic brands through the lens of MS-induced change avoidance. Overall, more research is needed to understand the factors that can moderate the effect of MS on evaluations of non-exciting brands.

Finally, it would be important for future research to investigate whether our findings may be contingent on consumers' dispositions and backgrounds. To illustrate, prior research suggests that the extent to which individuals embrace the notion of change differs across cultures (Choi, Koo, & Choi, 2007). Thus, it might be that the patterns we observed in this research may depend on a brand's target market. Lastly, future work can explore situations other than the onset of MS that can also increase consumers' tendency to avoid experiencing change. For example, it might be interesting to investigate whether different types of psychological threats may lead to similar increases in the change-avoidance tendency, hence altering consumers' reactions to brands and influencing brand evaluations. Exploring research directions such as the ones above can inform theory and provide important insights for practitioners.

Data availability

The authors do not have permission to share the BAV dataset. Detailed information about the dataset can be obtained from the corresponding author.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendices. Supplementary material

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.ijresmar.2023.11.002>.

References

- Aaker, J. L. (1997). Dimensions of brand personality. *Journal of Marketing Research*, 34(3), 347–356.
- Aaker, J. L., Fournier, S., & Brasel, S. A. (2004). When good brands do bad. *Journal of Consumer Research*, 31(1), 1–16.
- Acemoglu, D., Autor, D. H., & Lyle, D. (2004). Women, war, and wages: The effect of female labor supply on the wage structure at midcentury. *Journal of Political Economy*, 112(3), 497–551.
- Batra, R., Zhang, Y. C., Aydinoglu, N. Z., & Feinberg, F. M. (2017). Positioning multicountry brands: The impact of variation in cultural values and competitive set. *Journal of Marketing Research*, 54(6), 914–931.
- BAV Group (2023). *About brand asset valuator*.
- Boeuf, B. (2019). The impact of mortality anxiety on attitude toward product innovation. *Journal of Business Research*, 104, 44–60.
- Brasel, S. A., & Hagtvedt, H. (2016). Living brands: Consumer responses to animated brand logos. *Journal of the Academy of Marketing Science*, 44(5), 639–653.
- Burke, B. L., Kosloff, S., & Landau, M. J. (2013). Death goes to the polls: A meta-analysis of mortality salience effects on political attitudes. *Political Psychology*, 34(2), 183–200.
- Choi, I., Koo, M., & Choi, J. A. (2007). Individual differences in analytic versus holistic thinking. *Personality and Social Psychology Bulletin*, 33(5), 691–705.
- Chopik, W. J. (2017). Death across the lifespan: Age differences in death-related thoughts and anxiety. *Death Studies*, 41(2), 69–77.
- Chu, Y., Chu, J., & Liu, H. (2021). The impact of mergers and acquisitions on brand equity: A structural analysis. *International Journal of Research in Marketing*, 38(3), 615–638.
- Dabalén, A. L., & Paul, S. (2014). Estimating the effects of conflict on education in Côte d'Ivoire. *The Journal of Development Studies*, 50(12), 1631–1646.
- Datta, H., Ailawadi, K. L., & Van Heerde, H. J. (2017). How well does consumer-based brand equity align with sales-based brand equity and marketing-mix response? *Journal of Marketing*, 81(3), 1–20.
- Duflo, E. (2001). Schooling and labor market consequences of school construction in Indonesia: Evidence from an unusual policy experiment. *American Economic Review*, 91(4), 795–813.
- Dunn, L., White, K., & Dahl, D. W. (2020). A little piece of me: When mortality reminders lead to giving to others. *Journal of Consumer Research*, 47(3), 431–453.
- Durante, K. M., & Laran, J. (2016). The effect of stress on consumer saving and spending. *Journal of Marketing Research*, 53(5), 814–828.
- Eggert, A., Steinhoff, L., & Witte, C. (2019). Gift purchases as catalysts for strengthening customer–brand relationships. *Journal of Marketing*, 83(5), 115–132.
- Escalas, J. E., & Bettman, J. R. (2005). Self-construal, reference groups, and brand meaning. *Journal of Consumer Research*, 32(3), 378–389.
- Factiva (2023). *Monthly mentions of "death" in media in 2023*.
- Ferraro, R., Shiv, B., & Bettman, J. R. (2005). Let us eat and drink, for tomorrow we shall die: Effects of mortality salience and self-esteem on self-regulation in consumer choice. *Journal of Consumer Research*, 32(1), 65–75.
- 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.
- Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 18(1), 39–50.
- Freling, T. H., & Forbes, L. P. (2005). An examination of brand personality through methodological triangulation. *Journal of Brand Management*, 13(2), 148–162.
- Galani, C., Carpenter, G. S., & Rao, H. (2020). Disgusted and afraid: Consumer choices under the threat of contagious disease. *Journal of Consumer Research*, 47(3), 373–392.
- Geuens, M., Weijters, B., & De Wulf, K. (2009). A new measure of brand personality. *International Journal of Research in Marketing*, 26(2), 97–107.
- Gobrecht, F., & Marchand, A. (2022). The finitude of life—How mortality salience affects consumer behavior: A review. *Journal of Consumer Behaviour*, 22, 199–216.
- Greenberg, J., & Arndt, J. (2012). Terror management theory. *Handbook of Theories of Social Psychology*, 1, 398–415.
- Greenberg, J., Pyszczynski, T., Solomon, S., Rosenblatt, A., Veeder, M., Kirkland, S., & Lyon, D. (1990). Evidence for terror management theory II: The effects of mortality salience on reactions to those who threaten or bolster the cultural worldview. *Journal of Personality and Social Psychology*, 58(2), 308–318.
- Greenberg, J., Solomon, S., & Pyszczynski, T. (1997). Terror management theory of self-esteem and cultural worldviews: Empirical assessments and conceptual refinements. *Advances in Experimental Social Psychology* (Vol. 29, pp. 61–139). Academic Press.
- Hayes, A. F. (2017). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. Guilford Publications.
- Heitmann, M., Landwehr, J. R., Schreiner, T. F., & van Heerde, H. J. (2020). Leveraging brand equity for effective visual product design. *Journal of Marketing Research*, 57(2), 257–277.
- Hoch, S. J., & Deighton, J. (1989). Managing what consumers learn from experience. *Journal of Marketing*, 53(2), 1–20.
- Hohman, Z. P., & Hogg, M. A. (2015). Fearing the uncertain: Self-uncertainty plays a role in mortality salience. *Journal of Experimental Social Psychology*, 57, 31–42.
- Hoyle, R. H., Stephenson, M. T., Palmgreen, P., Lorch, E. P., & Donohew, R. L. (2002). Reliability and validity of a brief measure of sensation seeking. *Personality and Individual Differences*, 32(3), 401–414.
- Huang, Z. T., & Wyer, R. S. Jr. (2015). Diverging effects of mortality salience on variety seeking: The different roles of death anxiety and semantic concept activation. *Journal of Experimental Social Psychology*, 58, 112–123.
- Huang, Z. T., Huang, X., & Jiang, Y. (2018). The impact of death-related media information on consumer value orientation and scope sensitivity. *Journal of Marketing Research*, 55(3), 432–445.
- Janakiraman, R., Lim, J. H., & Rishika, R. (2018). The effect of a data breach announcement on customer behavior: Evidence from a multichannel retailer. *Journal of Marketing*, 82(2), 85–105.

- Johar, G. V., Sengupta, J., & Aaker, J. L. (2005). Two roads to updating brand personality impressions: Trait versus evaluative inferencing. *Journal of Marketing Research*, 42(4), 458–469.
- Kahneman, D., & Tversky, A. (1979). Prospect theory: An analysis of decision under risk. *Econometrica*, 47(2), 263–292.
- Keller, K. L. (1993). Conceptualizing, measuring, and managing customer-based brand equity. *Journal of Marketing*, 57(1), 1–22.
- Kressmann, F., Sirgy, M. J., Herrmann, A., Huber, F., Huber, S., & Lee, D. J. (2006). Direct and indirect effects of self-image congruence on brand loyalty. *Journal of Business Research*, 59(9), 955–964.
- Landau, M. J., Solomon, S., Greenberg, J., Cohen, F., Pyszczynski, T., Arndt, J., ... Cook, A. (2004). Deliver us from evil: The effects of mortality salience and reminders of 9/11 on support for President George W. Bush. *Personality and Social Psychology Bulletin*, 30(9), 1136–1150.
- Leonhardt, J. M., Keller, L. R., & Pechmann, C. (2011). Avoiding the risk of responsibility by seeking uncertainty: Responsibility aversion and preference for indirect agency when choosing for others. *Journal of Consumer Psychology*, 21(4), 405–413.
- Luffarelli, J., Delre, S. A., & Landgraf, P. (2023). How has the effect of brand personality on customer-based brand equity changed over time? Longitudinal evidence from a panel data set spanning 18 years. *Journal of the Academy of Marketing Science*, 51(3), 598–616.
- Luffarelli, J., Stamatogiannakis, A., & Yang, H. (2019). The visual asymmetry effect: An interplay of logo design and brand personality on brand equity. *Journal of Marketing Research*, 56(1), 89–103.
- Maheswaran, D., & Agrawal, N. (2004). Motivational and cultural variations in mortality salience effects: Contemplations on terror management theory and consumer behavior. *Journal of Consumer Psychology*, 14(3), 213–218.
- Malär, L., Krohmer, H., Hoyer, W. D., & Nyffenegger, B. (2011). Emotional brand attachment and brand personality: The relative importance of the actual and the ideal self. *Journal of Marketing*, 75(4), 35–52.
- Malär, L., Nyffenegger, B., Krohmer, H., & Hoyer, W. D. (2012). Implementing an intended brand personality: A dyadic perspective. *Journal of the Academy of Marketing Science*, 40(5), 728–744.
- Mandel, N., & Heine, S. J. (1999). Terror management and marketing: He who dies with the most toys wins. *NA—Advances in Consumer Research*, 26, 527–532.
- Mizik, N., & Jacobson, R. (2008). The financial value impact of perceptual brand attributes. *Journal of Marketing Research*, 45(1), 15–32.
- Mizik, N., & Jacobson, R. (2009). Valuing branded businesses. *Journal of Marketing*, 73(6), 137–153.
- Osinga, E. C., Zevenbergen, M., & van Zuijlen, M. W. (2019). Do mobile banner ads increase sales? Yes, in the offline channel. *International Journal of Research in Marketing*, 36(3), 439–453.
- Pennycook, G., Cannon, T. D., & Rand, D. G. (2018). Prior exposure increases perceived accuracy of fake news. *Journal of Experimental Psychology: General*, 147(12), 1865–1880.
- Pham, M. T., & Sun, J. J. (2020). On the experience and engineering of consumer pride, consumer excitement, and consumer relaxation in the marketplace. *Journal of Retailing*, 96(1), 101–127.
- Pyszczynski, T., Abdollahi, A., Solomon, S., Greenberg, J., Cohen, F., & Weise, D. (2006). Mortality salience, martyrdom, and military might: The great Satan versus the axis of evil. *Personality and Social Psychology Bulletin*, 32(4), 525–537.
- Ran, Y., & Wan, E. W. (2023). Enjoyment or autonomy? The interactive effect of brand ritual and brand personality on consumer purchase. *Psychology & Marketing*, 40(1), 89–106.
- Rindfleisch, A., Burroughs, J. E., & Wong, N. (2009). The safety of objects: Materialism, existential insecurity, and brand connection. *Journal of Consumer Research*, 36(1), 1–16.
- Russell, J. A., Weiss, A., & Mendelsohn, G. A. (1989). Affect grid: A single-item scale of pleasure and arousal. *Journal of Personality and Social Psychology*, 57(3), 493–502.
- Ruvio, A., Somer, E., & Rindfleisch, A. (2014). When bad gets worse: The amplifying effect of materialism on traumatic stress and maladaptive consumption. *Journal of the Academy of Marketing Science*, 42(1), 90–101.
- Schimmel, J., Simon, L., Greenberg, J., Pyszczynski, T., Solomon, S., Waxmonsky, J., & Arndt, J. (1999). Stereotypes and terror management: Evidence that mortality salience enhances stereotypical thinking and preferences. *Journal of Personality and Social Psychology*, 77(5), 905–926.
- Shi, H., Sridhar, S., Grewal, R., & Lilien, G. (2017). Sales representative departures and customer reassignment strategies in business-to-business markets. *Journal of Marketing*, 81(2), 25–44.
- Sirianni, N. J., Bitner, M. J., Brown, S. W., & Mandel, N. (2013). Branded service encounters: Strategically aligning employee behavior with the brand positioning. *Journal of Marketing*, 77(6), 108–123.
- Spencer, S. J., Zanna, M. P., & Fong, G. T. (2005). Establishing a causal chain: Why experiments are often more effective than mediational analyses in examining psychological processes. *Journal of Personality and Social Psychology*, 89(6), 845–851.
- Spiller, S. A., Fitzsimons, G. J., Lynch, J. G., Jr, & McClelland, G. H. (2013). Spotlights, floodlights, and the magic number zero: Simple effects tests in moderated regression. *Journal of Marketing Research*, 50(2), 277–288.
- Sundar, A., & Noseworthy, T. J. (2016). Too exciting to fail, too sincere to succeed: The effects of brand personality on sensory disconfirmation. *Journal of Consumer Research*, 43(1), 44–67.
- Swaminathan, V., Stilley, K. M., & Ahluwalia, R. (2009). When brand personality matters: The moderating role of attachment styles. *Journal of Consumer Research*, 35(6), 985–1002.
- Trump, R. K., & Newman, K. P. (2021). Emotion regulation in the marketplace: The role of pleasant brand personalities. *Marketing Letters*, 32, 231–245.
- Van Dijk, E., & Zeelenberg, M. (2007). When curiosity killed regret: Avoiding or seeking the unknown in decision-making under uncertainty. *Journal of Experimental Social Psychology*, 43(4), 656–662.
- Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology*, 54(6), 1063–1070.
- Whitler, K. A., Besharat, A., & Kashmiri, S. (2021). Exogenous brand crises: Brand infection and contamination. *Marketing Letters*, 32(1), 129–133.
- Yang, H., & Ma, J. (2020). How an epidemic outbreak impacts happiness: Factors that worsen (vs. protect) emotional well-being during the coronavirus pandemic. *Psychiatry Research*, 289, 113045.
- Yang, H., & Ma, J. (2021). How the COVID-19 pandemic impacts tobacco addiction: Changes in smoking behavior and associations with well-being. *Addictive Behaviors*, 119, 106917.
- Yang, H., Carmon, Z., Ariely, D., & Norton, M. I. (2019). The feeling of not knowing it all. *Journal of Consumer Psychology*, 29(3), 455–462.
- Yang, H., & Ma, J. (2023). Post-COVID-19 distress and unhealthy behavior. *Journal of Mental Health*, 32(6), 1080–1085.
- Yen, C. L., & Lin, C. Y. (2012). The effects of mortality salience on escalation of commitment. *International Journal of Psychology*, 47(1), 51–57.