

**Outrage or Indifference? The Moderating Roles of Brand Familiarity and Strength on
Social Media Content Emotionality Following Brand Crises**

Buffy Mosley

Doctoral Candidate at Emory University

Goizueta Business School, 1300 Clifton Rd. Atlanta, GA, 30322

Email: buffy.mosley@emory.edu Phone: (817) 891-7556

David A. Schweidel

Professor of Marketing at Emory University

Goizueta Business School, 1300 Clifton Rd. Atlanta, GA, 30322

Email: dschweidel@emory.edu Phone: (404)727-5275

Kunpeng Zhang

Assistant Professor of Information Systems at University of Maryland

Robert H. Smith School of Business

7621 Mowatt Ln, College Park, MD 20742

Email: kzhang@rhsmith.umd.edu Phone: (301) 405-0702

Outrage or Indifference? The Moderating Roles of Brand Familiarity and Strength on Social Media Content Emotionality Following Brand Crises

ABSTRACT

Social media offers brands the ability to gauge how consumers react to their marketing actions such as campaigns, as well as brand crises. While social media listening focuses on aggregate patterns across consumers, consumers may vary in terms of how they react to a crisis faced by a particular brand. Using the content of social media posts on Facebook brand pages, we examine consumers' language before and after distinct events to evaluate the effect of the event on the emotionality of their posts. We account for the extent to which consumers have interacted with the brand's page prior to the event and the strength of the brand. We find that brands experience a significant increase in negative emotional content after brand crises, but that brand familiarity and strength mitigate this shift. Comments from consumers who have engaged with the brand prior to the event include less negative language than comments from consumers posting on the brand's page for the first time after the event. Additionally, brand strength mitigates the negative emotionality among consumer responses after the event. We discuss the implications of our findings for brand managers using social media posts to gauge consumer perceptions.

Keywords: brand crisis, social media, online firestorms, event study

INTRODUCTION

#BoycottNike and #BurnItNow were among the top trending social media handles after Nike launched its 30th anniversary marketing campaign featuring controversial athlete Colin Kaepernick (Ladd 2018). Social media was inundated with millions of comments about the Nike brand after the polarizing campaign launch with some suggesting that Nike be boycotted and others supporting the brand's decision (Dudharejia 2018). In the days following the campaign launch, Nike stock price fluctuated, online sales grew by more than 30% and some suggested the brand was in crisis as a result of the campaign (Berr 2018). Similarly, Pepsi's launch of its campaign featuring Kendall Jenner generated a significant amount of social media buzz resulting in the company retracting the advertisement and issuing an apology within 24 hours (Zipkin 2017). Anecdotally, marketers have suggested that Nike's ad campaign was a calculated risk and that the brand could withstand any criticism it received (Pearl 2018). Others suggested that the ad campaign was consistent with Nike's brand perception among target consumers (Pearl 2018). Marketers recognize that consumer attitudes and brand evaluations are critical ingredients of brand equity (Keller 1993). Damaging information about brands can have severe consequences for brands, as rebuilding trust is difficult (Nooteboom et al. 1997).

Social media provides consumers with a platform on which to voice their opinions of brands. Researchers have shown that online word of mouth (WOM) can influence sales (e.g., Kumar et al. 2016, Chevalier and Mayzlin 2006, Liu 2006, Moe and Trusov 2011), television ratings (e.g., Godes and Mayzlin 2004) and product adoption (e.g., Trusov et al. 2009). Given the documented influence of online WOM on market performance, it is critical for brands to monitor consumers' social media posts to gauge how perceptions may be shifting. An increasing stream

of the social media literature explores consumer perceptions using social media (e.g., Culotta and Cutler 2016; Tirunillai and Tellis 2014; Schweidel and Moe 2014; Netzer et al. 2012; Lee and Bradlow 2011). Brand crises, such as product recalls (e.g., Cleeren et al. 2013; Borah and Tellis 2016) and product or social failures (e.g., Hansen et al. 2018) may arise suddenly due to consumers' use of social media.

In light of the considerable volume of social media posts surrounding such brand-related events, what meaningful insight can brands extract from social media? While popular social media listening platforms report volume and the average sentiment over time, such metrics fail to distinguish among contributors. Despite the increasing research utilizing social media metrics, limited work decomposes the aggregated measures into contributions from different segments of the social media contributor base. As a result, if brands were to observe fluctuations in volume or sentiment, they are limited in their ability to discern if such fluctuations warrant concern. In the cases of Nike and Pepsi mentioned earlier, did consumers who had previously engaged with the brand differ from those who were posting on the brand's Facebook page for the first time? Assessing how different groups of consumers react to brand-related events, whether they be positive or negative, is critical information as brands seek to engage with these groups over time.

In this research, we use an event study approach to understand how different social media users respond to brands in the wake of major brand-related events. Using Facebook data, we employ text analysis to capture the emotions expressed in over 120,000 user comments on the brand pages before and after critical events. With access to data on consumer comments from the time at which brand's created their Facebook pages, we distinguish between users who engaged with the brand prior to the event and those who post after the event for the first time. Drawing on

the brand equity literature, we also examine how brand strength may moderate emotionality consumers' social media posts following brand crises.

Our results indicate that both brand strength and brand familiarity (as inferred from his/her prior interaction with the brand's Facebook page) impact the emotionality expressed in Facebook comments. We find that brands experience a significant increase in negativity, marked by higher levels of comments containing anger and a significant decrease in posts containing joy, after brand crises. Interestingly, our analysis reveals that users who have previously engaged with the brand on Facebook express less negative emotion -- particularly less anger -- after the event compared to those who comment on the brand's Facebook page for the first time after the event. This indicates the importance of brands considering the composition of their contributors when determining how best to react to online comments in the wake of a brand crisis, as not all consumers will react to the crisis in the same way. We also find that brand strength moderates the way in which consumers react to a brand crisis. Following a brand crisis, we see that comments posted to the Facebook pages of strong brands contain less anger and more joy compared to the comments posted to the pages of weaker brands, suggesting that brand strength can aid a brand in times of a crisis.

The remainder of this article is structured as follows. We review the literature related to the social media word of mouth and brand crisis. We then discuss how brand familiarity and strength may moderate the effects of a brand crisis on consumers' social media activity. We then discuss the data used in our analysis and present model free evidence supporting the difference in emotionality before and after an event. We present our empirical analysis and discuss the findings. Lastly, we discuss the managerial implications and limitations of our research.

RELATED LITERATURE

Our research explores the emotions expressed in social media posts to understand changes in consumer brand sentiment surrounding brand crisis events. Drawing on the brand equity literature, we incorporate measures such as brand familiarity and brand strength to investigate the extent to which firms can insulate themselves from the consequences of a brand crisis. Our work draws on three streams of literature: social media, brand crises, and brand familiarity and strength. First, we provide a review of social media literature highlighting research that focuses on emotions. We then review the literature related to brand crises and negative publicity resulting from brand crises. Lastly, we detail the anticipated moderating impact of overall brand strength and familiarity on how consumers react to brand crises.

Emotionality in Social Media Posts

Given the proliferation of social media use, research in social media and online WOM has grown over the years. Researchers have shown that WOM can influence firm performance indicators such as consumers purchase decisions (Leskovec et al. 2007), sales (Chevalier and Mayzlin 2006; Liu 2006; Moe and Trusov 2011), television ratings (Godes and Mayzlin 2004), stock market performance (Tirunillai and Tellis 2014), and product adoption (Trusov et al. 2009). Others have investigated posting behavior of users (Moe and Schweidel 2012; Godes and Silva 2012; Toubia and Stephen 2013) and network effects within social media (Mayzlin and Yoga 2012; Watts and Dodds 2007; Trusov et al. 2010; Goldenberg et al. 2012).

A growing stream of research using social media data focuses on capturing consumer perceptions from online content. Lee and Bradlow (2011) use online product reviews to derive

market structure based on consumer perceptions. Similarly, Netzer et al. (2012) use consumer online forums and text mining techniques to derive market-structure using consumer co-mentions of brands. They propose a method of verifying consumer brand perceptions. Tirunillai and Tellis (2014) use Latent Dirichlet Allocation (LDA) to capture brand quality perceptions over time. Buschken and Allenby (2016) develop a sentence-constrained LDA model to determine topics of customer reviews and its impact on satisfaction. Schweidel and Moe (2014) demonstrate that social media data can be used to derive a measure of brand health, demonstrating the importance of accounting for the variation in comments that exist across social media venues. Packard, Moore and McFerran (2018) examine pronoun use by firm agents and find that agents' use of "we" rather than "I" increases customer satisfaction and purchasing.

In addition to the content of social media posts, research has also focused on the valence of social media posts. Chevalier and Mayzlin (2006) show that negative reviews have greater impact than positive reviews. Similarly, Luo (2007) find that consumer complaints have a negative impact on firm's stock market performance. Shin et al. (2008) find that positive and negative buzz are leading indicators of price fluctuations. While valence offers a convenient summary, it can be a coarse operationalization of consumers' multifaceted attitudes.

To alleviate this concern, researchers have begun using more granular measures of emotionality to provide increased nuance to their analysis, rather than limiting themselves to positive vs. negative sentiment. Earlier work in consumer behavior and psychology produced an extensive body of literature examining the influence of emotions on consumer judgement and behavior (Pham 2004; Cohen et al 2007; Forgas 1995; William and Aaker 2002). Researchers showed that opposing emotional valences (positive (e.g., happiness) vs. negative (e.g., sad)) have different impacts on consumer's cognition. A phenomenon known as affect congruency suggests

that consumers' evaluative judgements are congruent with their current affect resulting in positive (negative) evaluations when consumers engage in positive (negative) affect (Forgas 1995; Pham 1998). This has been found to apply to different product categories (Gorn et al. 1993), brand extension evaluations (Yeung and Wyer 2005), advertisements (Goldberg and Wilhelm 1987; Murry and Dacin 1996), and consumption choices (Pham 1998). Research has also explored specific emotions of the same valence and found that different emotions of the same valence (e.g., anger vs. sadness) can result in different outcomes (Lerner et. al 2004; Lerner and Fischhoff 2006). Several studies have revealed variations in cognitive processing among different emotional states. For example, sadness offers systematic cognitive processing while anger and joy favor heuristic information processing (Corson and Verrier 2007). Joy, disgust, anger and surprise have implications on customer satisfaction (Westbrooke and Oliver 1997). Anger has been linked to desire for punitive damages, retaliation, negative word of mouth, and optimistic judgements while fear induces greater risk aversion and pessimistic judgements (Gregoire and Fisher 2007; Schawrtz 2000; Lerner and Keltner 2000).

More recently, researchers have examined the two dimensions of emotions: arousal (high and low) and valence (positive and negative). Heath et la. (2001) explored emotionality in the context of the urban legend and found that content that aroused emotions were more popular (particularly emotions related to interest, surprise, joy and disgust). Berger and Milkman (2012) examine which type of emotion gets shared more and find evidence that emotional content indicative of high arousal (awe, anger, and anxiety) is shared more. Berger (2011) examines high emotional arousal (amusement and anxiety) and high physical arousal and find that physiological arousal drives information transmission. Ludwig et. al (2013) found a strong positive effect of

higher levels of affective content in consumer reviews on conversion rates. Yin (2014) finds that online reviews with more anger are perceived to be more helpful.

The analysis of content emotionality in the wake of a brand crisis may offer brands a method to assess consumer's responses to the situation. We explore the specific emotions that are expressed in social media responses from consumers at the time of brand-related crises. Consistent with prior research, in addition to examining the effect of the brand crises on positive and negative emotions, we also examine high-arousal emotions of positive and negative valence (e.g. anger, disgust, joy¹ and surprise).

Brand Crises

Brand crises resulting from adverse events can have serious repercussions for the brand. A brand crisis is defined as “an event that threatens a corporate's reputation and therefore its future” which include accidental, intentional, and uncontrollable events (Lerbinger 2012). Brand crises have received attention among marketers and practitioners as the consequences impact firm's financial performance (Chen et al. 2009; Cleeren et al. 2008; van Heerde et al. 2007), brand equity (Ahluwalia 2000; Dawar and Pillutla 2000), advertising effectiveness (Cleeren et al. 2013), and ultimately consumer buying decisions. Researchers have also investigated the various characteristics of brand crises such as blame attribution, firm response and, negative publicity. Blame literature explores how consumers attribute blame in light of product harm crisis and how firms should respond (Yin et al. 2016; Lei et al. 2012). Other researchers examined how firms should respond in brand crisis and the conditions under which firms should accept blame and apologize (Dawar and Pilluutla 2000).

Negative publicity arising from brand crises has been explored extensively in the literature. The negativity effect, whereby consumers weigh negative information more heavily than positive information, can affect consumers' perceptions of the brand (Aaker 1990; Lane and Jacobson 1995). Researchers have shown that extremely negative information is considered more diagnostic and interesting (Herr et al. 1991; Fiske 1980). Negative publicity can also damage brand equity, credibility and reduce consumer product evaluations (Lei et al. 2008). The implications of negative publicity have been explored in various contexts. Chevalier and Mayzlin (2006) show that negative online book reviews influence subsequent sales and Chen et al. (2009) show that negative third-party reviews impact stock returns. We expect that the negative publicity from a brand crisis will manifest as an increase in negative emotions in social media posts.

Recent research has also probed how brand crises emerge in digital media. Pfeffer et al. (2014) define online firestorms as an abrupt increase in primarily negative messages toward a brand. The authors highlight the potential for large volumes of messages to disseminate rapidly on digital media platforms suggesting that this type of brand crisis is important to marketers. Hansen et al. (2018) investigate social media firestorms specifically and find both short- and long-term effects of social media firestorms on consumer's brand perceptions, emphasizing that strong heterogeneity exists across firms. Borah and Tellis (2016) argue that social media a vital part of the product recall process and find evidence of a spillover effect of negative chatter about a brand on other brands in the same product category. Hsu and Lawrence (2016) investigate product recall announcements' impact on stock performance and find that product recalls have a negative impact on the firm and that volume and valence of online WOM intensifies this negative effect. They find that strong brand equity mitigates the negative impact of the volume

and valence of online WOM. Herhausen et al (2019) use a top-down approach to examine the negative emotions within consumer posts on social media and offer mediation strategies to brands to help prevent online firestorms.

In this research, we move beyond emotional valence to investigate the high arousal emotions (e.g. joy, anger, disgust, surprise) expressed in consumers' social media posts following brand-related crises. To the best of our knowledge, this research is among the first to consider the effect of brand familiarity as a potential moderator for how consumers react to a brand crisis, thereby considering the role of poster heterogeneity and the composition of the contributor base in the context of brand crises. In doing so, our approach enables us to distinguish how a brand's "core" audience and neophyte social media posters for a brand differ, which may affect the brand's strategy for responding to the crisis.

Brand Familiarity and Strength

Given the negative consequences of brand crises, scholars have shown that brand familiarity and brand personality can moderate consumer perceptions of a brand crisis. Despite the pervasiveness of the negativity effect, a disproportionate weighting of negative information compared to equally positive information, researchers have discovered boundary conditions that attenuate or moderate the negativity effect in the marketplace. Ahluwalia et al. (2000) find that a consumer's brand commitment moderates the negativity effect, with loyal consumers discounting disconfirmatory information and engaging in biased information processing. Dawar and Pillutla (2000) also show that selective processing by different customer segments can influence responses to brand crises. Consumers with positive expectations of the firm (loyal customers vs. potential customers) may insulate the brand in the brand crisis events as they may

counter-argue negative news about the firm to buffer cognitive dissonance. Consumers with existing brand loyalty may exhibit more sympathy for the brand and become brand advocates (Feldman and Lynch 1988). Others have shown that prior brand attitudes can lead to consistency-based information processing (Chaiken et al. 1996). Ahluwalia (2002) suggests that familiarity with the brand can attenuate the negativity effect of a brand crisis. Consumers who are familiar with the brand may perceive negative information as less diagnostic and put more weight on positive information while consumers unfamiliar with the brand may regard negative information more heavily. Consistent with the negativity effect, less attached consumers are more likely to consider negative information in their judgement and emotional response (Schnalz and Orth 2012).

In addition to an individual's familiarity with the brand, other factors associated with the brand's equity may influence on how consumers respond to the brand crisis events. Brand strength has been conceptualized in terms of consumer mindset metrics, financial measures, firm performance metrics or a combination of both (Aaker 1991, Keller 1993). Among the benefits that strong brands accrue are increased market share and benefits from price premiums (e.g., Park and Srinivasan 1994), increased leverage for product extensions (Keller and Aaker 1990; Morrin 1999), and higher quality perceptions (Rao and Monroe 1989; Dodds et al. 1991) and product evaluations (Leclerc et al. 1994; Brown and Dacin 1997). In addition to these advantages, Dawar and Pillutla (2000) report that strong brands with positive consumer expectations are more resilient to brand crises.

In this research, we regard brand strength as "the differential effect that brand knowledge has on consumer responses" (Keller 1993). Keller (1998) suggest that consumers are more willing to process brand communications more favorably for strong brands. To the extent that a

brand's communication efforts are regarded more favorably and effectively, we contend that consumers may be predisposed to respond more positively to adverse events facing strong brands. To measure brand strength, we use Young and Rubicam's Brand Asset Valuator, which draws on two categories to capture overall brand strength: energized differentiation and customer relevance (Lovett et al. 2014). This view of brand strength captures the brand's perceived strength among consumers. We expect that brand strength affects consumers' brand-related posts, with social media posts from stronger brands having lower levels of negative emotions.

In this research, we account for variation that exists across brands in regards to their brand strength. We also take into account a social media user's familiarity with a given brand, recognizing the heterogeneity that may exist among contributors. We anticipate that users who have posted previously on the brand's Facebook page will express fewer negatively valenced emotions and more positively valenced emotions following a brand crisis compared to those users who have not previously interacted with the brand on Facebook. In addition to brand familiarity moderating the content emotionality following a brand crisis, we also anticipate that brand strength will moderate content emotionality, with posts for stronger brands containing fewer negatively valenced emotions and more positively valenced emotions.

METHODOLOGY

We employ an event study methodology that has been widely used in marketing literature (Elberse 2007; Agrawal and Kamakura 1995; Tellis and Johnson 2007; Lane and Jacobson 1995). In our analysis, we draw comparisons between the emotionality of consumers' brand-related social media posts before and after a brand crisis. We assume that emotions expressed prior to the event are reflective of consumers' brand perceptions prior to the event, while

emotions expressed after the event are indicative of post-crisis perceptions. In our empirical analysis, we examine ten firms across five product categories. Table 1 details the events we examine in this analysis.

<INSERT TABLE 1 ABOUT HERE>

We define the event date as the date when the firm makes the announcement. In the case of Starbucks and United Airlines, we use the date the video was uploaded to social media. We reviewed major media outlets for announcements, as well as the firm's website and social media accounts, to identify the event date. To validate that the proper event date was selected, we confirm that user comments related to the event occurred after the identified event date.²

Similar to Chen et al. (2009), we compare social media content emotionality during a calibration window (the period over which we obtain the baseline emotionality of consumers' posts to social media) to that during a test window (the period after the event during which we assess the change in the emotionality of consumers' posts). We use a 10-day window, beginning our calibration window 10 days prior to event and ending our test window 10 days after the event. As brand crises do not occur frequently, we do not risk any potentially confounding events in our event window.³

Table 2 provides illustrative Facebook comments before and after the brand crisis events.

<INSERT TABLE 2 ABOUT HERE>

Data

We collect social media data from Facebook brand pages for 10 brands: Chick-fil-a, Delta Airlines, Nike, Nordstrom's, Southwest Airlines, Starbucks, Taco Bell, Target, United Airlines and Volkswagen. For each brand we use Facebook graph API⁴ to download all available activities made by a brand, such as posts and all user comments on posts. Our data includes all

activity from the day that the brand page was created on Facebook through January 1, 2018. Events in our data set for these 10 brands range from January 2011 to April 2017. For each comment we capture the date of the post, time of the post, text of the post and user ID associated with the individual who posted the comment. User-specific identifiers allow us to identify users who engage with the brand both before and after the incident.⁵

We analyze the text of user comments using a computational text-mining tool, Linguistic Inquiry and Word Count (LIWC), used in prior literature to capture valence and emotionality of text (Berger and Milkman 2012). We employ the NRC emotion lexicon to assess the presence of positively and negatively valenced words, as well as high-arousal emotions (anger, disgust, joy and surprise) (Mohammad et al. 2013). For each social media comment, we use LIWC to tabulate the proportion of words in the comment that correspond to positively and negatively valenced words, as well as the four specific emotions. Table 3 provides summary statistics, by brand, for the data.

<INSERT TABLE 3 ABOUT HERE>

Table 4 provides additional summary statistics relating to the time at which users contributed social media comments. Within our dataset, users post an average of 1.1 comments.

Approximately 85% of comments to the brand pages occur after the brand crisis. Additionally, with approximately 0.90% of our comments being contributed by individuals who first interacted with the brand prior to the brand crisis, indicating that a large portion of Facebook comments are contributed by individuals interacting with the brand for the first time after a brand crisis. Within our data we find that brands may respond to consumers' comments within Facebook and account for these brands using an indicator variable at the comment level where 1 denotes comments made to brands who respond to consumers in the 10-day after period.

<INSERT TABLE 4 ABOUT HERE>

As an illustration, in Figure 1 we present the fraction of user comments we observe during our observation window for Nike, Southwest and United Airlines before and after the brand crisis. Figure 1 reveals a substantial increase in user posts beginning with the day of the brand crisis. Across brands, we see an increase in comments on the brands Facebook page after the brand crisis event, suggesting that consumers may be using Facebook as a platform to express their opinion on the brand crisis.

<INSERT FIGURE 1 ABOUT HERE>

To measure brand strength, we rely on the BAV dataset provided by Lovett et al. (2014). The dataset includes 136 measures of brand characteristics for top U.S. brands. Brand strength is measured on a continuous scale and is comprised of consumers' responses to questions relating to energized differentiation and brand relevance.⁶ The data was collected from a variety of sources that include a survey of 4,768 subjects between September – October 2010, a quarterly survey of 17,000 individuals conducted by Young and Rubicam between 2008 and 2010, and secondary data from Interbrand and the American Customer Satisfaction Index (ACSI).⁷

Model-Free Evidence

To explore differences among consumers' posts, based on the extent to which they interacted with the brand on social media prior to the brand crisis, we divide commenters into three groups: (1) those who only interact with the brand prior to the brand crisis, (2) those who only interact with the brand after the brand crisis, and (3) those who interact with the brand both before and after the brand crisis. Figure 2 shows the average proportion of positively and

negatively valenced emotional content across the three groups. Those who comment both before and after the brand crisis are more positive than those who only comment before or after the crisis. Following a brand crisis, those who only comment in the wake of the incident are more negative than those who have interacted with the brand previously. This provides preliminary evidence that brand familiarity may insulate a brand from shifts in perceptions following a brand crisis.

<INSERT FIGURE 2 ABOUT HERE>

For those commenters who post both before and after the brand crisis, we distinguish between their posts based on whether the posts occurred before or after the incident. Figure 3 shows that the use of positively valenced emotions increases slightly after the crisis, while the use of negatively valenced emotions decreases slightly. This would be consistent with those who are familiar with the brand coming to the brand's defense following a brand crisis.

<INSERT FIGURE 3 ABOUT HERE>

Model

To examine the impact of brand familiarity and strength on the emotionality of social media posts following a brand crisis, we conduct a comment-level analysis by estimating the following linear regression:

$$\begin{aligned}
 \text{Emotion}_{jc} = & \alpha_0 + \lambda * \text{After}_c + \delta * \text{BeforeCmtCount}_c + \varphi * \text{AfterCmtCount}_c \\
 & + \vartheta * \text{BrandStrength}_{b(c)} + \gamma_1 * \text{BeforeCmtCount}_c * \text{AfterCmtCount}_c \\
 & + \gamma_2 * \text{After}_c * \text{BrandStrength}_{b(c)} + \gamma_3 * \text{After}_c * \text{BeforeCmtCount}_c + \beta * X_c + \mu_{i(c)} + \varepsilon_{jc}
 \end{aligned}
 \tag{2}$$

where, $j = 1, \dots, 6$ indexes the dependent variables (positively valenced emotions, negatively valenced emotions, anger, disgust, joy, surprise), $i = 1, \dots, N$ indexes the distinct commenters ($N=110,586$), $b=1, \dots, 10$ indexes brands and $c = 1, \dots, C$ indexes comments in our dataset ($C=128,650$). We estimate linear regressions with six different dependent measures, using the same set of predictor variables to determine how brand strength and familiarity impact the effect of brand crises on the emotionality expressed in consumers' social media posts. The independent variable $After_c$ is an indicator variable such that $After_c = 1$ denotes that the comment was posted after the brand crisis for the brand associated with comment c and is equal to 0 otherwise. We account for brand strength using $BrandStrength_{b(c)}$, where the subscript denotes the brand b ($b=1, \dots, 10$) associated with comment c . The interaction term $After_c * BrandStrength_{b(c)}$ allows use to assess the extent to which brand strength moderates the impact of the brand crisis on comment emotionality.

The term $BeforeCmtCount_c$ is the number of comments posted on the brand's Facebook page prior to comment c by the individual who contributed comment c , before the brand crisis for the brand mentioned in comment c . Similarly, $AfterCmtCount_c$ captures the number of comments posted on the brand's Facebook page prior to comment c by the individual who contributed comment c , after the brand crisis for the brand mentioned in comment c . Our primary interest is in the interaction term $BeforeCmtCount_c * After_c$, which captures the extent to which brand familiarity (operationalized via $BeforeCmtCount$) moderates the impact of the brand crisis on content emotionality. We also include the interaction $BeforeCmtCount_c * AfterCmtCount_c$ to assess the extent to which those who interact frequently with the brand both before and after the brand crisis may differ from those who primarily interacted with the brand before or after the crisis.

X_c denotes a vector of control variables. It includes $TimeSinceEvent_c$, which captures time trend relative to the event date and takes on values between $-10, \dots, 10$. It also includes $NegEmoPrior_c$ and $PosEmoPrior_c$, which account for the valenced emotions expressed in comment $c-1$. In addition to valence, we include the number of comments ($VolumeComments_c$) that appear before comment c . $BrandCmmt_{b(c)}$ is an indicator variable such that $BrandCmmt_{b(c)} = 1$ if brand b responds to user comments during our event window and is equal to 0 otherwise. Temporal factors are included to control for the day of week and time of day at which comment c was posted. The indicator variable $Weekend_c = 1$ if the comment was posted on Saturday and Sunday. The variable $Morning_c = 1$ if comment c was posted between 5:00 AM-11:59 AM, and $Afternoon_c = 1$ if it was posted between 12:00 PM-6:59 PM. We allow for individual random effects, $\mu_{i(c)}$, to capture unobserved heterogeneity that may exist across commenters. Finally, ε_{jc} denotes the idiosyncratic error term. We estimate the regressions with robust standard errors.

Results

Our analysis seeks to determine the extent to which brand strength and familiarity moderate the emotionality of consumer responses to brand crises. The result from our analysis are presented in Table 5.

<INSERT TABLE 5 ABOUT HERE>

The control variables included in our analysis reveal the extent to which the timing of Facebook posts by brands can impact the emotionality of user comments. Content posted by users on weekends tends to contain lower levels of positively valenced emotions, anger and joy. In comparison to posts at night, content posted in the morning tends to contain higher levels of

negatively valenced emotions, anger and disgust. As more time elapses from the brand crisis, we observe a general decrease in negatively valenced emotions, anger, and disgust, while the levels of joy and surprise increase. In addition to the time at which comments are posted, the sentiment of the immediately preceding comment are related to the emotionality expressed. Negative sentiment in the prior comment is associated with greater negatively valenced emotions. Similarly, positive sentiment in the prior comment is associate with more positively valenced emotions, joy and surprise. This suggest that posters may exhibit “bandwagon” effects where the negative (positive) nature of the previous comment increases the likelihood that the following comment may also be negative (positive) in nature (Moe and Schweidel 2012). Lastly, we consider whether or not the firm responds to consumers after the brand crisis. We find that a firm’s decision to respond significantly increases the emotionality of users’ comments.⁸

We next turn our attention to the emotionality of comments after the brand crisis compared to before. Consistent with prior work, the coefficient for $After_c$ is significant and associated with an increase in overall negative emotional content. In particular, we see an increase in content expressing anger after the brand crises. Anger may increase as a result of consumers receiving disconfirmatory information that contrasts with their image of the brand. Brand crises may cause consumers to reevaluate their relationship with brands resulting in unfavorable sentiments when disconfirming information about the brand arises (Aaker 2004).

In addition to increases in negative emotion, we also see a significant decrease in overall positive emotional content. We see a significant decrease in emotional language related to joy after brand crises and an increase in the extent to which surprise is expressed, suggesting that the event may have come to a shock to consumers. This is consistent with past research that has shown that brand crisis can disconfirm dependability and trust perceptions of brands weakening

consumers relationships (Gregoire and Fisher 2008; Aaker 2004). These results suggest that the negative effect around brand crisis events influence consumer emotional perceptions of brands (Lei, Dawar & Lemmink 2008; Edrem and Swait 1998).

Next, we examine differences in emotionality related to brand familiarity. As users' previous interactions with the brand before the brand crisis increase, consumers are more prone to express positively valenced emotions, joy and surprise, while they are less likely to express disgust. Interestingly, those who have interacted with the brand prior to the brand crisis are also more likely to express anger. One potential explanation for this finding is that consumers may use the brand's Facebook page as an avenue to voice complaints. As one would expect, those who interact with the brand multiple times following the brand crisis, as evidenced by the coefficient of *AfterCmtCount*, are less likely to express positively valenced emotions or joy. Rather, they are more likely to express negatively valenced emotions. We do, however, find that they are less likely to express disgust. This polarization is consistent with literature which has shown that online word of mouth can be populated with both extreme negative and positive consumer responses. (Moe and Schweidel 2012).

Next, we examine how users' interactions with the brand prior to the crisis may moderate the extent to which content emotionality shifts after the event. Though we do not observe a significant interaction between the number of comments posted prior to the brand crisis and the number of comments posted after, we do find that the interaction term *After * BeforeCmtCount* is significant. As users posted more comments on the brand's Facebook page prior to the crisis, their posts after the crisis are expected to contain less negatively valenced emotions and less anger. This suggests that, after a brand crisis, the language employed by those who are already familiar and have interacted with the brand via social media differs from the

language used by those who are posting to social media about the brand for the first time following the incident.

Taken together, our findings illustrate how users react to a brand crisis on social media. In addition to the decrease in joy and increase in surprise, anger and negatively valenced emotions, those users who have previously posted comments on the brand's Facebook page are expected to post with less anger compared to those who have not previously interacted with the brand. This suggests that there are systematic differences across commenters linked to prior interactions with the brand on social media. This is consistent with research that has shown that brand familiarity can help buffer brands in crises (Aaker 1990), as those who have interacted with the brand previously on social media may hold favorable brand associations in their memory.

To examine the extent to which brand strength may mitigate the effects of a brand crisis, we examine the interaction term *After * BrandStrength*. Taking the main effect of brand strength and interaction into account, the coefficients reveal higher levels of joy. In addition to experiencing higher levels of joy in comments posted after a brand crisis compared to weaker brands, comments posted to the Facebook pages of strong brands also contain lower amounts of negatively valenced emotions and anger following brand crises. This indicates that brand strength can insulate strong brands in the event of a brand crisis.

DISCUSSION

With the widespread use of social media, consumer opinions are quickly thrust into the mainstream, enabling brands the opportunity to assess consumer perceptions. Consumer

perception are critical components of brand equity and consequently marketing strategy. Our research aims to examine the impact of brand crises on the emotionality of the language that consumers express in social media comments following the brand-related events. We examine the emotionality of social media posts before an event compared to the emotionality of posts after the event to assess the impact of the brand-related event on consumers' perceptions of the brand. We incorporate measures of brand strength and familiarity to assess the extent to which they may mitigate (or exacerbate) the effects of a brand crisis on brand perceptions.

Our analysis offers insights for managers reacting to brand crises. Our results highlight the importance of brands understanding the composition of the social media contributor base in the wake of a brand crisis. Ignoring the differences that exist in the contributor base in terms of social media users' prior familiarity with the brand overlooks a critical factor that is related to the emotions they express. Although we observe an increase in negative emotions after a brand crisis, we find that users who have interacted with the brand previously express fewer negative emotions toward the brand compared to those who only comment after the brand crisis. This suggests that those who have interacted with the brand previously on social media may hold more favorable brand associations or exhibit greater attachment to the brand that can result in higher positive emotionality towards the brand (Aaker 1993).

By distinguishing between those who are likely to be predisposed toward being more favorable and those who are likely to be more negative, brands can formulate their response to the brand crisis based on the perceptions of each group. Brands may encourage those who have engaged with brand previously to comment in attempts to create a buffer from the more negative comments coming from those who have not interacted with the brand previously. Moreover, marketers and shareholders should be prudent in examining consumer response to brand crises

with aggregated metrics as new commenters may produce a large volume of negative comments that overshadow the voice of consumers who have engaged with the brand previously and may represent the brand's more loyal customers. In terms of the decisions brands must make following a crisis, it may be in the brand's interest to overweigh the feedback being provided by more loyal customers rather than ceding to the larger volume of consumers who are less engaged with the brand.

We contribute to the social media literature by demonstrating how it can be used to assess how different consumer segments respond to brand crises. Keller (2009) offers a customer-based brand equity model in which he highlights consumer emotional response regarding the brand as a vital component in modern day brand equity. The emotionality of consumers' social media posts offers insights that can aid marketers in developing and sustaining brand equity. In addition to considering broader categories of positively and negatively valenced emotions, we also examine how brand crises affect consumers' use of high arousal emotions such as joy, anger disgust, and surprise. In deriving such measures from social media posts, brands can construct a multidimensional view of consumer's perceptions surrounding brand crises.

Recent literature has shown that consumer responses to brand crisis are heterogenous and that brands can benefit from adopting a more heterogenous response approach to diffusing potential online firestorms (Herhausen et al. 2019). An understanding of consumers' emotions around brand crises can aid firms in generating appropriate responses based on an individual (or segment's) emotional state. The way in which a brand chooses to respond, such as by employing empathy or providing a detailed explanation, may vary depending on the specific emotions being expressed by different consumer groups. For example, some groups that exhibit joy and anger may tend to adopt heuristic-based processing that relies on prior knowledge, while other groups

may express sadness and adopt systematic processing that relies more on new information than on prior knowledge (Schwarz 2000). A firm's response to these distinct groups must take into account not only the size of the group, but the importance of the group to the brand.

The presence of emotions in content may convey meaning beyond simply a positive or negative sentiment. For example, anger and disgust have been linked to blame attribution, with the presence of anger in response to a brand crisis indicating an assumption of blame toward the firm (Weiner 1980; Oliver 1993). Anger has also been linked to retaliation and the spread of negative word of mouth. Understanding consumers' emotional response could aid firms in seeking to mitigate the cascading effect of virality originating with angry consumers (Gregoire and Fisher 2007; Schwarz 2000; Bougie et al. 2003). By monitoring the presence of content emotionality in the wake of brand crises, firms can potentially detect shifts in the degree to which consumers hold them responsible for the event. Such an assessment offers more value than a general measure of negative sentiment. Moreover, anger is associated with increased risk seeking and optimism. In contrast, fear is associated with risk aversion and pessimism (Schwarz 2000). It is not uncommon for stock prices to fluctuate in the time surrounding a brand crisis as risk perceptions oscillate. Future research may investigate the extent to which content emotionality on social media may provide insight into stock market performance as stakeholders reevaluate their decisions.

We show that brand strength can insulate the brand from negative social media buzz. Strong brands experience a significant increase in positive and joy emotional language after the brand crisis event and a significant decrease in negative and anger related emotional content. Our findings suggest that consumers may be more forgiving for strong brands after transgressions. While much of the extant literature on product harm focuses on product recalls, our empirical

analysis makes use of brand-related events including product failures, service failures and what some may consider ethical/moral failures. The broad base of events on which we draw demonstrates the effectiveness of brand strength at buffering a range of brand crises.

While our research offers additional insights for marketers in terms of managing a brand crisis, it is not without limitations. Though we draw on brand crises from ten different firms in five product categories, future research may assess if our findings generalize to other product or service categories. While we make use of data collected from Facebook brand pages, it would be worthwhile to examine content emotionality following brand crises on different social media platforms.

We do not incorporate information about the severity of the brand crises or types of brand crises into our empirical analysis. If objective information about the magnitude of the damage stemming from a brand crisis were available across different types of incidents, researchers could probe the potential limits of our findings. Another area that could offer useful insights would be incorporating the network structure of social media contributors. Doing so would allow for the identification of the influence that social connections have on content emotionality. Additionally, segmentation based on the intensity or content of prior interactions with the brand could be further probed to develop and identify more refined poster segments, which could be used by the firm when responding to a crisis. Lastly, the emotionality of brand's response could be explored to determine what type of emotional response are better suited in certain types of brand crises.

REFERENCES

1. Aaker, D. A., & Keller, K. L. (1990). Consumer evaluations of brand extensions. *Journal of marketing*, 54(1), 27-41.
2. Aaker, J., Fournier, S., & Brasel, S. A. (2004). When good brands do bad. *Journal of Consumer research*, 31(1), 1-16.
3. Aaker, J. L. (1997). Dimensions of brand personality. *Journal of marketing research*, 34(3), 347-356.
4. Ahluwalia, R., Burnkrant, R. E., & Unnava, H. R. (2000). Consumer response to negative publicity: The moderating role of commitment. *Journal of marketing research*, 37(2), 203-214.
5. Agrawal, J., & Kamakura, W. A. (1995). The economic worth of celebrity endorsers: An event study analysis. *Journal of marketing*, 59(3), 56-62.
6. Berr, J. (2018). Nike Stock Price Reaches All-Time High After Colin Kaepernick ad, *CBS News*, accessed at <https://www.cbsnews.com/news/nike-stock-price-reaches-all-time-high-despite-colin-kaepernick-ad-boycott>
7. Berger, J., & Milkman, K. L. (2012). What makes online content viral?. *Journal of marketing research*, 49(2), 192-205.
8. Borah, A., & Tellis, G. J. (2016). Halo (spillover) effects in social media: do product recalls of one brand hurt or help rival brands?. *Journal of Marketing Research*, 53(2), 143-160.
9. Bougie, R., Pieters, R., & Zeelenberg, M. (2003). Angry customers don't come back, they get back: The experience and behavioral implications of anger and dissatisfaction in services. *Journal of the academy of marketing science*, 31(4), 377-393.
10. Brown, T. J., & Dacin, P. A. (1997). The company and the product: Corporate associations and consumer product responses. *Journal of marketing*, 61(1), 68-84.
11. Büschken, J., & Allenby, G. M. (2016). Sentence-based text analysis for customer reviews. *Marketing Science*, 35(6), 953-975.
12. Cleeren, K., Dekimpe, M. G., & Helsen, K. (2008). Weathering product-harm crises. *Journal of the Academy of Marketing Science*, 36(2), 262-270.
13. Chaiken, S., Giner-Sorolla, R., & Chen, S. (1996). Beyond accuracy: Defense and impression motives in heuristic and systematic information processing.
14. Chen, Y., Ganesan, S., & Liu, Y. (2009). Does a firm's product-recall strategy affect its financial value? An examination of strategic alternatives during product-harm crises. *Journal of Marketing*, 73(6), 214-226.
15. Chevalier, J. A., & Mayzlin, D. (2006). The effect of word of mouth on sales: Online book reviews. *Journal of marketing research*, 43(3), 345-354.
16. Culotta, A., & Cutler, J. (2016). Mining brand perceptions from twitter social networks. *Marketing science*, 35(3), 343-362.
17. Dawar, N., & Pillutla, M. M. (2000). Impact of product-harm crises on brand equity: The moderating role of consumer expectations. *Journal of marketing research*, 37(2), 215-226.
18. Dodds, W. B., Monroe, K. B., & Grewal, D. (1991). Effects of price, brand, and store information on buyers' product evaluations. *Journal of marketing research*, 28(3), 307-319.
19. Dudharejia, M. (2018) Four Branding Lessons from Nike's Colin Kaepernick Ad, *Entrepreneur*, retrieved at: <https://www.entrepreneur.com/article/321130>

20. Elberse, A. (2007). The power of stars: Do star actors drive the success of movies?. *Journal of Marketing*, 71(4), 102-120.
21. Feldman, J. M., & Lynch, J. G. (1988). Self-generated validity and other effects of measurement on belief, attitude, intention, and behavior. *Journal of applied Psychology*, 73(3), 421.
22. Fredrickson, B. L. (1998). What good are positive emotions?. *Review of general psychology*, 2(3), 300-319.
23. Godes, D., & Mayzlin, D. (2004). Using online conversations to study word-of-mouth communication. *Marketing science*, 23(4), 545-560.
24. Godes, D., & Silva, J. C. (2012). Sequential and temporal dynamics of online opinion. *Marketing Science*, 31(3), 448-473.
25. Goldenberg, J., Oestreicher-Singer, G., & Reichman, S. (2012). The quest for content: How user-generated links can facilitate online exploration. *Journal of Marketing Research*, 49(4), 452-468.
26. Grégoire, Y., & Fisher, R. J. (2008). Customer betrayal and retaliation: when your best customers become your worst enemies. *Journal of the Academy of Marketing Science*, 36(2), 247-261.
27. Hansen, N., Kupfer, A. K., & Hennig-Thurau, T. (2018). Brand crises in the digital age: The short-and long-term effects of social media firestorms on consumers and brands. *International Journal of Research in Marketing*, 35(4), 557-574.
28. Heath, C., Bell, C., & Sternberg, E. (2001). Emotional selection in memes: the case of urban legends. *Journal of personality and social psychology*, 81(6), 1028.
29. Herr, P. M., Kardes, F. R., & Kim, J. (1991). Effects of word-of-mouth and product-attribute information on persuasion: An accessibility-diagnostics perspective. *Journal of consumer research*, 17(4), 454-462.
30. Hsu, L., & Lawrence, B. (2016). The role of social media and brand equity during a product recall crisis: A shareholder value perspective. *International journal of research in Marketing*, 33(1), 59-77.
31. Joshi, A. M., & Hanssens, D. M. (2009). Movie advertising and the stock market valuation of studios: a case of “great expectations?”. *Marketing Science*, 28(2), 239-250.
32. Keller, K. L. (1993). Conceptualizing, measuring, and managing customer-based brand equity. *Journal of marketing*, 57(1), 1-22.
33. Kumar, A., Bezawada, R., Rishika, R., Janakiraman, R., & Kannan, P. K. (2016). From social to sale: The effects of firm-generated content in social media on customer behavior. *Journal of Marketing*, 80(1), 7-
34. Ladd, B. (2018) Nike and Kaepernick: Business 101, *Forbes*, accessed at: <https://www.forbes.com/sites/brittainladd/2018/09/11/what-should-colin-kaepernick-do-next-become-a-police-officer-and-nike-should-design-the-uniform/#637ee88f28d8>
35. Lane, V., & Jacobson, R. (1995). Stock market reactions to brand extension announcements: The effects of brand attitude and familiarity. *Journal of Marketing*, 59(1), 63-77.
36. Laroche, M., Kim, C., & Zhou, L. (1996). Brand familiarity and confidence as determinants of purchase intention: An empirical test in a multiple brand context. *Journal of Business Research*, 37(2), 115–120.
37. Lazarus, R. S. (1991). Cognition and motivation in emotion. *American psychologist*, 46(4), 352.

38. Leclerc, F., Schmitt, B. H., & Dubé, L. (1994). Foreign branding and its effects on product perceptions and attitudes. *Journal of marketing Research*, 31(2), 263-270.
39. Lee, T. Y., & Bradlow, E. T. (2011). Automated marketing research using online customer reviews. *Journal of Marketing Research*, 48(5), 881-894.
40. Lei, J., Dawar, N., & Gürhan-Canli, Z. (2012). Base-rate information in consumer attributions of product-harm crises. *Journal of Marketing Research*, 49(3), 336-348.
41. Lerbinger, O. (2012). *The crisis manager: Facing disasters, conflicts, and failures*. Routledge.
42. Leskovec, Jure, Lada A. Adamic, and Bernardo A. Huberman. "The dynamics of viral marketing." *ACM Transactions on the Web (TWEB)* 1.1 (2007): 5.
43. Liu, Y. (2006). Word of mouth for movies: Its dynamics and impact on box office revenue. *Journal of marketing*, 70(3), 74-89.
44. Lovett, M., Peres, R., & Shachar, R. (2014). A data set of brands and their characteristics. *Marketing Science*, 33(4), 609-617.
45. Mayzlin, D., & Yoganarasimhan, H. (2012). Link to success: How blogs build an audience by promoting rivals. *Management Science*, 58(9), 1651-1668.
46. Moe, W. W., & Schweidel, D. A. (2012). Online product opinions: Incidence, evaluation, and evolution. *Marketing Science*, 31(3), 372-386.
47. Moe, W. W., & Trusov, M. (2011). The value of social dynamics in online product ratings forums. *Journal of Marketing Research*, 48(3), 444-456.
48. Moe, W. W., Schweidel, D. A., & Trusov, M. (2011). What influences customers' online comments. *MIT Sloan Management Review*, 53(1), 14.
49. Morrin, M. (1999). The impact of brand extensions on parent brand memory structures and retrieval processes. *Journal of Marketing Research*, 36(4), 517-525.
50. Netzer, O., Feldman, R., Goldenberg, J., & Fresko, M. (2012). Mine your own business: Market-structure surveillance through text mining. *Marketing Science*, 31(3), 521-543.
51. Schwarz, N. (2000). Emotion, cognition, and decision making. *Cognition & Emotion*, 14(4), 433-440.
52. Oliver, R. L. (1993). Cognitive, affective, and attribute bases of the satisfaction response. *Journal of consumer research*, 20(3), 418-430.
53. Packard, G., Moore, S. G., & McFerran, B. (2018). (I'm) Happy to Help (You): The Impact of Personal Pronoun Use in Customer–Firm Interactions. *Journal of Marketing Research*, 55(4), 541-555.
54. Park, C. S., & Srinivasan, V. (1994). A survey-based method for measuring and understanding brand equity and its extendibility. *Journal of marketing research*, 31(2), 271-288.
55. Pearl, D., (2018) Why Nike's 30th Anniversary Ad Featuring Colin Kaepernick Is a Worthwhile Risk On Labor Day, it debuted a spot with the former NFL player, *AdWeek*, accessed at: <https://www.adweek.com/brand-marketing/why-nikes-30th-anniversary-ad-featuring-colin-kaepernick-is-a-worthwhile-risk-for-the-brand/>
56. Pennebaker, J. W., Francis, M. E., & Booth, R. J. (2001). Linguistic inquiry and word count: LIWC 2001. *Mahway: Lawrence Erlbaum Associates*, 71(2001), 2001.
57. Pfeffer, J., Zorbach, T., & Carley, K. M. (2014). Understanding online firestorms: Negative word-of-mouth dynamics in social media networks. *Journal of Marketing Communications*, 20(1-2), 117-128.

58. Rao, A. R., & Monroe, K. B. (1989). The effect of price, brand name, and store name on buyers' perceptions of product quality: An integrative review. *Journal of marketing Research*, 26(3), 351-357.
59. Ruch, W. (1993). Exhilaration and humor. *Handbook of emotions*, 1, 605-616.
60. Schweidel, D. A., & Moe, W. W. (2014). Listening in on social media: A joint model of sentiment and venue format choice. *Journal of Marketing Research*, 51(4), 387-402.
61. Tellis, G. J., & Johnson, J. (2007). The value of quality. *Marketing Science*, 26(6), 758-773.
62. Tirunillai, S., & Tellis, G. J. (2014). Mining marketing meaning from online chatter: Strategic brand analysis of big data using latent dirichlet allocation. *Journal of Marketing Research*, 51(4), 463-479.
63. Toubia, O., & Stephen, A. T. (2013). Intrinsic vs. image-related utility in social media: Why do people contribute content to twitter?. *Marketing Science*, 32(3), 368-392.
64. Trusov, M., Bucklin, R. E., & Pauwels, K. (2009). Effects of word-of-mouth versus traditional marketing: findings from an internet social networking site. *Journal of marketing*, 73(5), 90-102.
65. Vallaster, C., & von Wallpach, S. (2013). An online discursive inquiry into the social dynamics of multi-stakeholder brand meaning co-creation. *Journal of Business Research*, 66(9), 1505-1515.
66. Van Heerde, H., Helsen, K., & Dekimpe, M. G. (2007). The impact of a product-harm crisis on marketing effectiveness. *Marketing Science*, 26(2), 230-245.
67. Watts, D. J., & Dodds, P. S. (2007). Influentials, networks, and public opinion formation. *Journal of consumer research*, 34(4), 441-458.
68. Westbrook, R. A., & Oliver, R. L. (1991). The dimensionality of consumption emotion patterns and consumer satisfaction. *Journal of consumer research*, 18(1), 84-91.
69. Yin, C. Y., Yu, H. Y., & Poon, P. (2016). Consumers' attributions and brand evaluations in product-harm crises: The role of implicit theories of personality. *Journal of Consumer Behaviour*, 15(1), 87-95.
70. Zipkin, N. (2017) Pepsi Ignites Outrage with Kendal Jenner Ad, *Entrepreneur.com*, accessed at: <https://www.entrepreneur.com/article/292450>

FOOTNOTES

¹ Joy shares conceptual space with other high-arousal emotions such as amusement (Lazarus 1991; Ruch 1993; Frederickson 1998; Heath et al. 2001).

² In the case with Nike, a popular athlete is pictured with the new apparel one day prior to the official statement by Nike. To ensure consistent selection of event dates across brands and reliance on brand's dissemination of information, we use the date of the official statement by Nike as the event date. Robustness checks using the two different dates show that both dates produce similar results in our analysis.

³ We conduct robustness checks in which we conduct our analysis with different event windows (5, 15, and 30 days) (Agrawal and Kamakura, 1995; Elberse 2007; Joshi and Hanssens 2009). Analyses using these alternative event windows yielded substantively similar results.

⁴ <https://developers.facebook.com/docs/graph-api/>

⁵ Recent changes to the API as of December 2017 no longer include a user ID for privacy concern. We therefore selected brand crises that occurred prior to this change for our empirical analysis.

⁶ Appendix A details the specific survey questions and derivation of the brand strength measure.

⁷ We rely on the responses from 2010, the most recent data available from Lovett et al. (2014), to operationalize brand strength for the brands in our study.

⁸ To assess the robustness of our results, we vary the length of the event window by considering a 3-day and 5-day event window. These analyses yielded substantively similar results. As an alternative to a measure of brand strength, we estimated models using brand-specific fixed effects. We find that the effects of brand familiarity on content emotionality are substantively similar (See Appendix B).

TABLES

Table 1. Events Studied in the Analysis

Brand	Category	Event Description	Date
Chick-fil-a	Food & Dining	Baptist Press published article where Chick fil a CEO states he supports traditional marriages	July 19, 2012
Delta Airlines	Travel Services	A global computer outage at Delta headquarters in Atlanta lead to hundreds of canceled flights.	Aug 08, 2016
Nike	Sports Apparel	Nike launched a new line of Hijabs for Muslim women in sports arena sparking controversial consumer responses.	March 8, 2017
Nordstrom's	Department Store	Nordstrom's announced that the company would no longer provide Ivanka Trump's clothing line sparking politically charged consumer responses.	February 2, 2017
Southwest Airlines	Travel Services	A technology glitch (faulty router) caused a system wide outage resulting in thousands of cancelled flights.	Jul 20, 2016
Starbucks	Food & Dining	Starbucks consumer post viral video regarding Starbucks new red cup design sparking controversial consumer responses.	Nov 10, 2015
Taco Bell	Food & Dining	Taco Bell faced claims and legal suit for allegations that its seasoned beef used in food products was only 35% beef.	Jan 25, 2011
Target	Department Store	Target allows customer and employees to use restroom of their choice.	Aug 17, 2016
United Airlines	Travel Services	A man refused to give up his seat on a overbooked United Airlines flight and was forcibly removed from the fight. Other passengers recorded the incident and uploaded it to social media.	Apr 10, 2017
Volkswagen	Automobile	The EPA accused Volkswagen of using software in diesel cars to deceive emission test. Volkswagen recalled more than 480k cars in the U.S. and faced fines up to \$18 billion.	Sept 18, 2015

Table 2. Facebook Comments on Brand Pages

Brands	Before Event Comment	After Event Comment
Chick-fil-a	Just went and got my free sandwich. I painted an old t-shirt to look like a cow. My Chic-fil-A was crowded, but then again it always is. There were lots of moo moo cows there too, too cute!	Wonder if the ones on here bashing CFA have gone and bashed the Boy Scouts for their beliefs as well. Guess I need to go and see This is a major company that has stated they do not believe that all people should have equal rights. That's the problem. If they said this about your own race, sexuality or religion you would understand
Delta Airlines	Well said. Delta taking care of their customers and planes.	Ruined my children's first trip to Disney world! They were in tears! Wait time for help 6 hours! Where's my voucher for my over 5 hour delay from DC to Cleveland on Friday? That was awful. You gotta do something for me atleast.
Nike	PLEASE NIKE, I NEED HELP WITH MY SHOES, IM A Partial amputee .. I LOVE NIKE I NEED INSOLES THAT WILL HOLD UP AND BE HANDICAP FRIENDLY...PLEASE HELP PLEASE HELP PLEASE HELP. Thank you ???? Richard Francis...rfrancis13167@gmail.com	So proud, Nike. We used to buy from a different shoe company with VERY different values. Our family is now ALL NIKE. Not only do we believe in your message, but your products just happen to be great Guess I bought my last pair of Nikes.
Nordstrom's	Marshall Parker you should do it! Nevermind I just realized you shaved lmao	boycott nordstrom for removing ivanka trump merchandise LOVE the poodle -- HATE your politics!!
Southwest Airlines	An airline with a heart. Flying LEO'S to the memorial services for fallen angels is a class act and greatly appreciated by this retired cop.	southwest just give em a break...they are a great airline and computers don't always work! Just sayin! Been stuck in Vegas now for 2 days thanks southwest
Starbucks	Caffe Verona is my favorite!!!!	Haters gonna hate ????...Eggnog latte,can't wait to have one!?? #lovestarbucks #goldcardmember I love the people who serve my Starbucks, my coffee... The cup I could care less about! Gimme Creme Bre all year!
Taco Bell	Volcano \$5 Box=FREAKIN' AWESOME!	I love Taco Bell! My colon doesn't, but who cares what he thinks? He's a jerk! I'm never eating there again you r sooooo disgusting in sooo many ways
Target	Please change your security guards uniforms back to the old dark blue one. Me and my family felt much safer with the guards wearing the police looking uniform.	What do you intend to do about keeping men out of the dressing rooms that I send my 11yr old daughter into? Target is still putting confused men as a priority over it's female customers. Letting men use women's dressing rooms is beyond stupid.
United Airlines	They understand dogs but one thing United doesn't understand is customer care and that is why I will never fly United again.	The CEO should resign. Point blank. Just fly southwest where they beat their competitors and not their passengers
Volkswagen	GRC beetles have an almost inhuman launch. I bet it could outlaunch a Zonda.	Well I guess nobody will ever read this replay but I need to share my thoughts. In the past 10 years I have owned 6 VW. One was a 05 Jetta TDI. I still have 2 at this time but when these are gone.... I will never buy any VW in the rest of my life.... you have lied to us and I can't forgive... good luck with your crusade... you will need it Will never leave VW , by far the most iconic trademark .

Table 3. Summary Statistics of Facebook Comments by Brand

Brand	Positive	Negative	Anger	Disgust	Joy	Surprise	Comments Before Event	Comments After Event
Chick Fil A	6.13	3.77	1.97	1.84	3.6	1.05	253	1,092
Delta Airlines	4.81	2.11	0.74	0.85	2.6	1.27	911	7,849
Nike	3.57	2.79	1.35	1.17	2.22	0.82	142	1,644
Nordstrom	5.6	3.14	1.16	1.65	3.91	1.61	9,454	13,462
Southwest Airlines	4.43	2.56	0.97	0.8	2.2	1.08	984	9,429
Starbucks	7.49	1.76	0.72	0.77	6.14	1.47	880	1,620
Taco Bell	4.71	3.09	2.29	1.38	3.05	1.66	5,715	4,650
Target	5.04	3.03	0.98	0.94	2.26	1.1	217	1,411
United Airlines	6.18	5.67	2.55	2.48	1.55	1.34	419	59,239
Volkswagen	4.79	3.32	1.38	1.41	3.16	1.01	226	9,397
Overall	5.60	4.18	1.87	1.84	2.46	1.35	19,201	109,793

Table 4. Frequency Table for Category Variables

Variable	Percentage
Weekdays (Mon-Fri)	84.60
Weekend (Sat & Sun)	15.40
Morning (5am – 11:59am)	14.05
Afternoon (12pm – 6:59pm)	28.08
Night (7pm – 4:59am)	57.87
Brand Comment = 1	75.82
After brand crisis	85.11

Table 5. Model Results

	(1)	(2)	(3)	(4)	(5)	(6)
	Positive	Negative	Anger	Disgust	Joy	Surprise
After	-1.67**	3.89**	4.43**	-0.29	-5.88**	0.93**
	(0.51)	(0.35)	(0.27)	(0.25)	(0.43)	(0.24)
Before Cmt Count	0.43**	0.10*	0.34**	-0.09*	0.18	0.10**
	(0.12)	(0.05)	(0.09)	(0.04)	(0.10)	(0.04)
After Cmt Count	-0.11**	0.09	0.03	-0.09**	-0.07**	0.04
	(0.03)	(0.05)	(0.02)	(0.03)	(0.02)	(0.02)
Before Cmt Count X After Cmt Count	0.53	-0.06	-0.03	-0.03	-0.02	0.06
	(0.53)	(0.07)	(0.05)	(0.06)	(0.14)	(0.08)
Before Cmt Count X After	-0.80	-0.35*	-0.40**	0.08	-0.01	-0.15
	(0.72)	(0.14)	(0.13)	(0.11)	(0.32)	(0.12)
Brand Strength	-1.85**	0.39	2.19**	-0.82**	-1.30**	0.85**
	(0.33)	(0.22)	(0.19)	(0.15)	(0.27)	(0.15)
Brand Strength X After	1.62**	-1.91**	-2.81**	0.07	2.72**	-0.74**
	(0.34)	(0.24)	(0.20)	(0.16)	(0.29)	(0.16)
Time Since Event	-0.01	-0.09**	-0.04**	-0.03**	0.12**	0.03**
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
NegEmoPrior	0.00	0.02**	0.01**	0.01**	-0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
PosEmoPrior	0.02**	0.01	0.00	-0.00	0.01**	0.01*
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Brand Cmt	1.29**	1.46**	0.72**	0.58**	0.67**	0.40**
	(0.11)	(0.08)	(0.04)	(0.05)	(0.09)	(0.06)
Volume of Cmts	-0.00	0.00**	0.00**	0.00**	-0.00**	-0.00*
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Weekend (Sat or Sun)	-0.42**	-0.11	-0.41**	-0.03	-0.27**	-0.06
	(0.10)	(0.09)	(0.06)	(0.06)	(0.08)	(0.05)
Morning (5am-11:59am)	-0.04	0.24**	0.36**	0.15*	-0.08	0.07
	(0.08)	(0.08)	(0.06)	(0.06)	(0.06)	(0.04)
Afternoon (12pm-6:59pm)	0.10	-0.09	0.07*	0.01	0.07	0.02
	(0.06)	(0.06)	(0.03)	(0.04)	(0.05)	(0.03)
Constant	6.63**	0.80*	-2.57**	2.49**	6.03**	-0.11
	(0.49)	(0.32)	(0.26)	(0.24)	(0.41)	(0.22)

= * p<0.05, ** p<0.01 Notes: Standard errors in parentheses. Night and Weekday are the baseline categories for time of day and day of week measures respectively.

FIGURES

Figure 1. Volume of Comment for Select Brands

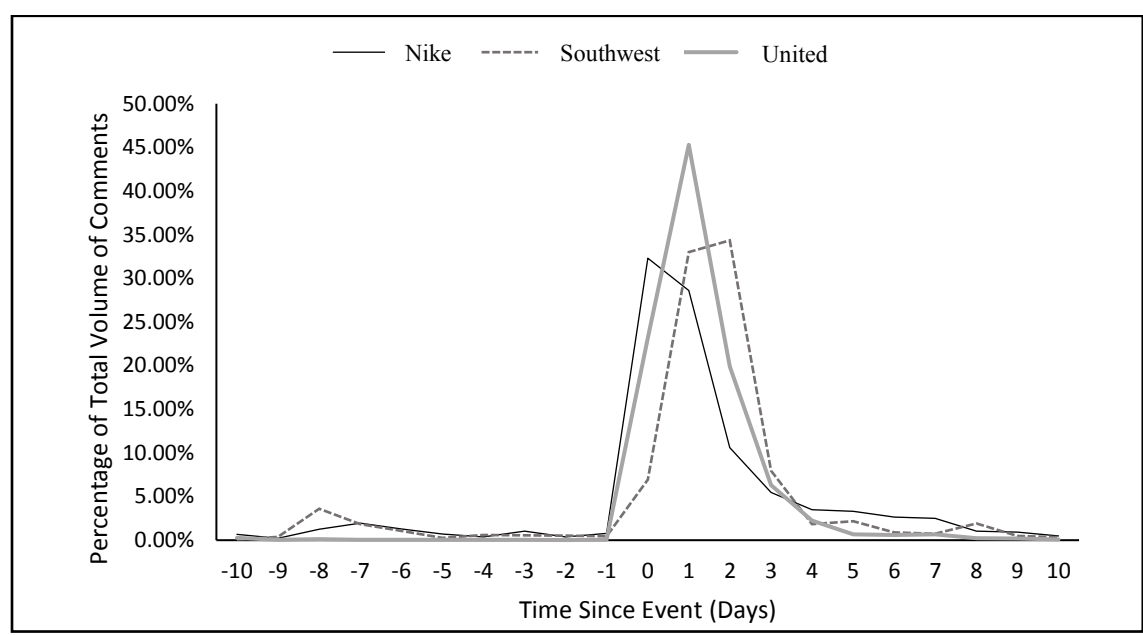
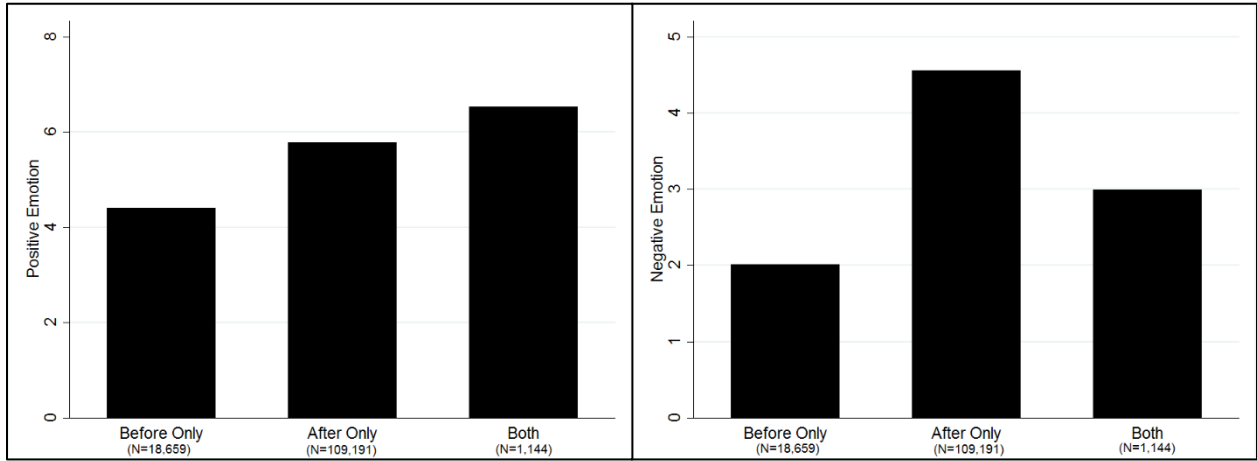
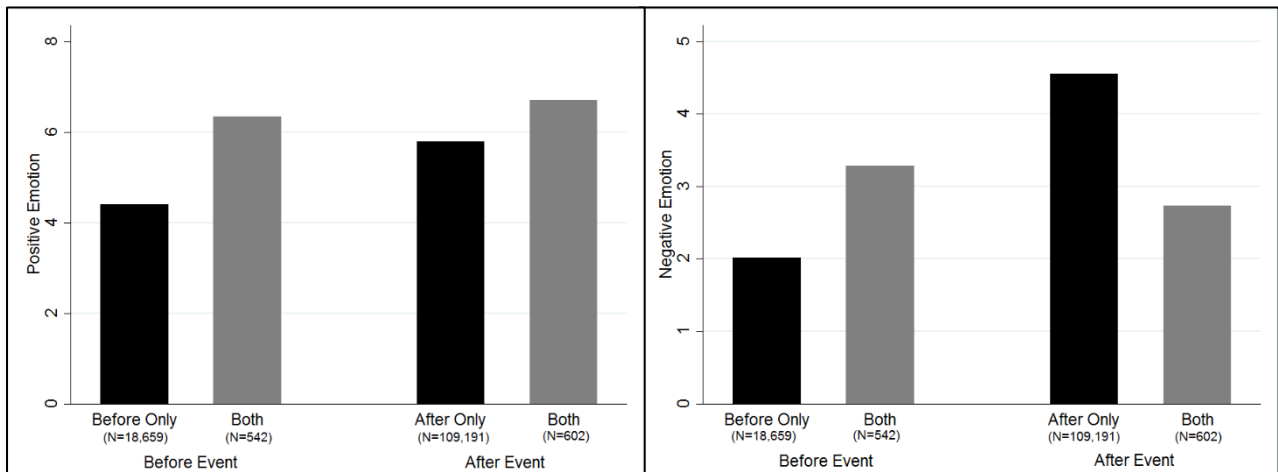


Figure 2. Average Positively and Negatively Valenced Emotion Across Commenter Segments



*Note: N denotes the number of observations associated with each commenter segment

Figure 3. Average Positive and Negative Emotion Before and After Event by Commenter Segment



*Note: N denotes the number of observations associated with each commenter segment

Appendix A: Detail on Brand Strength Covariate

Variable	Values	Comments
Energized_Differentiation_C	0-1	Can be slightly > 1 because of population quota weighting. Average (Different_pct, Distinctive_pct, Unique_pct, Dynamic_pct, Innovative_pct)/100. Each of these components indicate the percentage of respondents who checked this attribute with respect to the brand.
Relevance_C	0-6	Average of scores for the question "How appropriate is BRAND for you personally?" (scale of 1-7) -1.
Brand_Strength_C	0-6	Energized_Differentiation_C*Relevance_C

Brand name	Category	Energized_Differentiation_C	Relevance_C	Brand_Strength_C
Chick-Fil-A	Food and dining	0.491	2.958	1.454
Delta Airlines	Travel services	0.401	2.265	0.908
Nike	Clothing products	0.685	3.721	2.549
Nordstrom	Clothing products	0.558	2.396	1.336
Southwest Airlines	Travel services	0.547	2.415	1.322
Starbucks	Food and dining	0.681	2.779	1.892
Taco Bell	Food and dining	0.487	3.529	1.721
Target	Department Stores	0.488	4.462	2.179
United Airlines	Travel services	0.289	2.219	0.642
Volkswagen	Cars	0.630	1.935	1.220

Appendix B: Model Results with Brand Fixed Effects

	(1) Positive	(2) Negative	(3) Anger	(4) Disgust	(5) Joy	(6) Surprise
After	-1.32** (0.37)	0.46* (0.23)	0.36* (0.17)	0.07 (0.16)	-1.23** (0.29)	-0.45** (0.16)
Before Cmt Count	0.51** (0.12)	0.05 (0.05)	0.27** (0.09)	-0.12** (0.04)	0.27** (0.10)	0.11** (0.04)
After Cmt Count	-0.10** (0.03)	0.05 (0.05)	0.01 (0.02)	-0.11** (0.03)	-0.03 (0.02)	0.01 (0.02)
Before Cmt Count X After Cmt Count	0.54 (0.53)	-0.02 (0.07)	0.01 (0.06)	-0.02 (0.06)	-0.01 (0.14)	0.07 (0.08)
Before Cmt Count X After	-0.89 (0.72)	-0.38** (0.14)	-0.50** (0.13)	0.11 (0.11)	-0.09 (0.32)	-0.28* (0.12)
Time Since Event	0.02 (0.02)	0.02 (0.01)	0.00 (0.01)	0.01 (0.01)	0.03* (0.01)	0.03** (0.01)
NegEmoPrior	-0.00 (0.00)	0.02** (0.00)	0.01* (0.00)	0.01 (0.00)	-0.00 (0.00)	0.00 (0.00)
PosEmoPrior	0.01** (0.00)	0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)	0.01* (0.00)	0.00 (0.00)
Brand Cmt	3.69** (0.35)	1.09** (0.21)	0.27* (0.13)	-0.28 (0.15)	1.41** (0.27)	1.22** (0.16)
Volume of Cmts	-0.00** (0.00)	-0.00** (0.00)	-0.00 (0.00)	-0.00 (0.00)	-0.00** (0.00)	0.00 (0.00)
Weekend (Sat or Sun)	-0.42** (0.10)	0.06 (0.09)	-0.32** (0.06)	-0.01 (0.06)	-0.47** (0.09)	-0.05 (0.05)
Morning (5am-11:59am)	-0.01 (0.08)	0.27** (0.08)	0.33** (0.06)	0.17** (0.06)	-0.06 (0.06)	0.05 (0.04)
Afternoon (12pm-6:59pm)	0.05 (0.06)	-0.03 (0.06)	0.12** (0.03)	0.03 (0.04)	-0.03 (0.05)	0.04 (0.03)
Delta Airlines	-1.14** (0.26)	-1.68** (0.23)	-1.26** (0.12)	-0.99** (0.18)	-0.87** (0.21)	0.29** (0.11)
Nike	-2.32** (0.34)	-0.99** (0.32)	-0.66** (0.18)	-0.67** (0.22)	-1.18** (0.27)	-0.09 (0.14)
Nordstrom	-3.02** (0.37)	-1.10** (0.26)	-0.90** (0.15)	0.05 (0.20)	-0.72* (0.31)	-0.19 (0.16)
Southwest Airlines	-4.78** (0.39)	-2.19** (0.29)	-1.25** (0.17)	-0.75** (0.21)	-2.42** (0.32)	-0.94** (0.17)
Starbucks	-1.23** (0.46)	-2.59** (0.29)	-1.33** (0.17)	-0.83** (0.22)	1.55** (0.39)	-0.37 (0.20)
Taco Bell	-3.69** (0.38)	-0.98** (0.28)	0.28 (0.18)	-0.21 (0.21)	-1.47** (0.31)	0.02 (0.17)
Target	-1.00** (0.30)	-0.78** (0.26)	-0.97** (0.14)	-0.91** (0.18)	-1.28** (0.21)	0.09 (0.13)
United Airlines	-3.06** (0.39)	1.01** (0.30)	0.27 (0.17)	0.99** (0.23)	-3.06** (0.32)	-0.76** (0.17)
Volkswagen	-4.51** (0.39)	-1.66** (0.28)	-0.83** (0.17)	-0.22 (0.21)	-1.49** (0.32)	-1.23** (0.17)
Constant	7.11** (0.38)	3.21** (0.26)	1.56** (0.18)	1.82** (0.20)	4.52** (0.31)	1.23** (0.16)

= * p<0.05, ** p<0.01 Notes: Standard errors in parentheses. Night and Weekday are the baseline categories for time of day and day of week measures respectively. Chick Fil A is the baseline brand.