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Product-harm crisis management: Time heals all wounds?

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ABSTRACT

This paper focuses on product-harm crises and examines consumer responses associated with product defect in three time periods (i.e., 3 days, 3 months and 1 year after a crisis). An experiment was conducted based on three widely accepted- influences on product-harm crisis management (i.e., crisis extent, social responsibility and organizational responses). The fourth influencing factor, time, was introduced in the present study. The four-factor model for measuring the effectiveness of product-harm crisis management was tested with particular attention to the impact of time. Crises were described in scenarios for a fictitious mobile phone. The results demonstrate that the effects of a crisis are minimal a few months after the crisis has occurred. Consumers tend to "forget" about the crisis and its effects, especially in cases when the company is socially responsible, and when the company issues a voluntary recall of its product.

1. Introduction

A crisis is a critical situation which, if mishandled, can inflict serious damage on the organization (Carley and Lin, 1995; Perrow, 1984; Arpan and Pompper, 2003). From a management perspective, crises are "either low probability or high consequence events that jeopardize the most fundamental goals of an organization" (Weick, 1988). A crisis, having its roots in an organization's external and internal environment (March and Simon, 1958; Perrow, 1984), can be any unexpected event, such as a fire, a storm, a security breach, a labor strike and food poisoning (Miller, 1987).

A crisis can strike any company at any time. If the company does not respond to the crisis immediately, then the crisis escalates into a catastrophe (Davies and Walters, 1998). Regardless of their severity, crises pose a serious threat to companies. The factor that determines how well a company will withstand a crisis is its ability to respond to that crisis. Effective crisis management can control the negative publicity and protects the company's image (Stafford et al., 2002).

Although product-harm crisis incidents are now rampant, only a few research studies that have been conducted on the topic (e.g., Klein and Dawar, 2004). Although there are a very limited number of studies that have examined the time span between the primary signals of potential injuries and the actual date when the recall is issued (e.g., Standop, 2006) there are no previous studies about the impact of time on consumers' attitudes in a product-harm crisis situation.

Thus, the main aim of this paper is to investigate whether consumers eventually forget or simply ignore the product-harm crisis. More precisely, the central goal of the study is to extend the model, which measures organizational success in crisis handling by introducing a fourth factor, "time", which consists of three levels: 3 days, 3 months and 1 year after the crisis. For example, after how long would consumers buy a new product by a company that had gone through a crisis? Would they consider the company socially responsible a year after the crisis? The rest of the paper is organized as follows. The literature review will be presented first (Section 2) followed by the conceptual framework (Section 3) and the methodology (Section 4) sections. The results of this work follow (Section 5) and this paper concludes with the conclusions (Section 6) and suggestions for future research in Section 7.

2. Literature review

Product-harm crises are complex situations wherein products are found to be defective, unsafe or even dangerous (Dawar and Pillutla, 2000). Siomkos and Kurzbard (1994) define product-harm crisis as an "abrupt break of the product life cycle". Product-harm crises, which may erupt from various causes (e.g., manufacturer's negligence, product misuse, sabotage, etc.), could cause serious survival problems to the company. Regardless of their cause, product-harm crises result in vast financial costs for the company, negative effects on sales and even destruction of their corporate

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image (Siomkos, 1999). During a product-harm crisis, consumers often receive negative information about the product and the company. As a result, after a crisis consumer attitudes will change negatively (Siomkos and Kurzbard, 1994). In order for the company to be able to bring the customers back to purchasing its products, certain immediate actions are necessary. Proactive product recall, victim compensation and accept responsibility for liability are some of these actions met in the relevant literature (Siomkos and Shrivastava, 1993; Siomkos and Kurzbard, 1994; Siomkos and Malliaris, 1992).

According to Elliott et al. (2005), a possible weakness of crisis management literature is rooted on its organization centrism. Consumer perceptions associated with the organizational responses to the crisis have received little attention. Empirical examinations, have been mainly focused on investigating the most important factors influencing crisis management, such as the amount and intensity of media attention (Weinberger and Romeo, 1989), the type of media coverage (Jolly and Mowen, 1984; Weinberger et al., 1991), the amount and degree of injuries (Mowen, 1980; Mowen and Ellis, 1981), the attention from regulatory bodies (Weinberger, 1986), the company's reputation (Siomkos and Shrivastava, 1993), the crisis type (Coombs, 1995; Mitroff and Pearson, 1993), the company's message (Griffin et al., 1991; Jorgensen, 1994,1996) and the company's response (Siomkos and Kurzbard, 1994).

Consumers' attitudes are the most important indicator for measuring the effectiveness of crisis management (Siomkos and Shrivastava, 1993). Reintroduction of a harmful product is a difficult procedure and requires appropriate corporate actions as well as consumers' desire for it. Effective crisis management involves the consumer's approval of the organizational response and consumer's persuasion that the product is safe again as the company has overcome the crisis (Siomkos, 1999).

Previous research on product-harm crisis has identified three major factors, which have a significant impact on consumers' perceptions and buying behavior: (1) the company's reputation (Siomkos and Shrivastava, 1993; Siomkos, 1999) and corporate social responsibility (Shrivastava, 1995; Fombrum et al., 2000), (2) the company's response to the crisis (Siomkos, 1999) and (3) the crisis extent (Mowen and Ellis, 1981).

Relevant literature supports that that well-known companies could more effectively overcome product-harm crises as a good reputation protects the company when a crisis hits (Jones et al., 2000; Mak, 2005). As Fombrun and VanRiel (2003) argue, a positive reputation could decrease the damages that may stem from the crisis. Moreover, Siomkos and Kurzbard (1994) and Siomkos and Shrivastava (1993) found that a highly respected company is regarded more favorably in cases of product-harm crises. Linked to reputation, research attention has also been paid to corporate social responsibility (CSR). According to Singhapakdi et al. (1995), a company ameliorates its social image through CSR. Consumers, in general, reward socially responsible companies via their repeated purchases (Luo and Bhattacharya, 2006) and tend not to prefer products produced by "unethical" companies (Vinten, 1998). Klein and Dawar (2004) found that CSR affects consumers' attributions of blame about product-harm crises, and thus, it could be regarded as an important factor in affecting consumers' attitudes and perceptions during crises.

Furthermore, organizational response has a major impact on consumers during product-harm crises. Shrivastava and Siomkos (1989) demonstrated that there are four basic organizational responses. (a) *Denial*: the company denies the responsibility for the harm and does not show any concern with consumers' welfare, (b) *Involuntary recall*: the company recalls its product after the order of an agency, (c) *Voluntary recall*: the company chooses to recall its product before the government or a governmental agency forces it to do so, and (d) *Super effort*: the company tries hard to communicate a responsible image. It recalls the harmful product immediately and compensates the victims. Moreover, the company informs the customers about how to return the defeat product and may offer special discounts and coupons of another product.

Severity of harm in a crisis is assessed in terms of the number and severity of injuries or deaths of people and animals, and harm to the environment. Studies reveal that a company in a high-injury crisis case is perceived less favorably than a company in a low-injury one (Mowen and Ellis, 1981). Other studies have proposed that severity of injury affects the placement of blame and responsibility (Tedeschi and Nesler, 1993; Kelly and Campbell, 1997). Severity has also an impact on the emotional response of stakeholders. More serious crises are more likely to have a more long lasting effect on stakeholders (Zyglidopoulos, 2001).

3. Conceptual framework and research hypotheses

The present study uses the model comprised by the three widely accepted factors which influence the effectiveness of product-harm crisis management, i.e., CSR, crisis extent and organizational response. Aiming at extending the model, the study introduces a fourth factor, "time", which consists of three levels: 3 days, 3 months and 1 year after the crisis.

Standop's (2006) study incorporates time in crisis management. He examined the impact of time span between gathering initial evidence of a crisis and the product recall. His findings demonstrated that time is a crucial factor as the more time elapses between the crisis occurring and the product recall, the harder is for the company to regain its customers' trust. However, the present study incorporates time in crisis management from a different perspective. It attempts to investigate whether time has an impact on consumers' general impression, perceived danger of the harmful product and purchase intention. As a result, the first research question of the current study could be expressed as follows:

RQ: Given the same extent of a product-harm crisis, organizational response and CSR, will time affect consumers' perceptions and purchase intention?

As literature review reveals, CSR has a positive impact on consumers' attitudes and perceptions during crises. According to Henderson (2007), CSR minimizes harm, promotes good causes and helps resolving outstanding social and environmental problems. Furthermore, Klein and Dawar (2004) conclude that CSR affects consumers' attributions of blame about product-harm crises. Other studies also agree that CSR reduces risk (Spincer, 1978; McGuire et al., 1988). Consequently, the first research hypothesis of this study is as follows:

H_1. Given the levels same crisis extent and organizational response, consumers will perceive a more socially responsible company as more successful in handling the crisis than a less socially responsible company in the three different time periods (i.e., 3 days, 3 months and 1 year after the crisis).

Shrivastava and Siomkos (1989) indicate that denial and involuntary recall are least favorable to consumers than voluntary recall and super effort. Moreover, they conclude that consumers are much more likely to form a positive opinion about the company and to buy a new product when the super effort response is used. Based on the above, the second research hypothesis is as follows:

H_2. Given the same levels of CSR and crisis extent, response consumers will perceive a company as more successful the closer

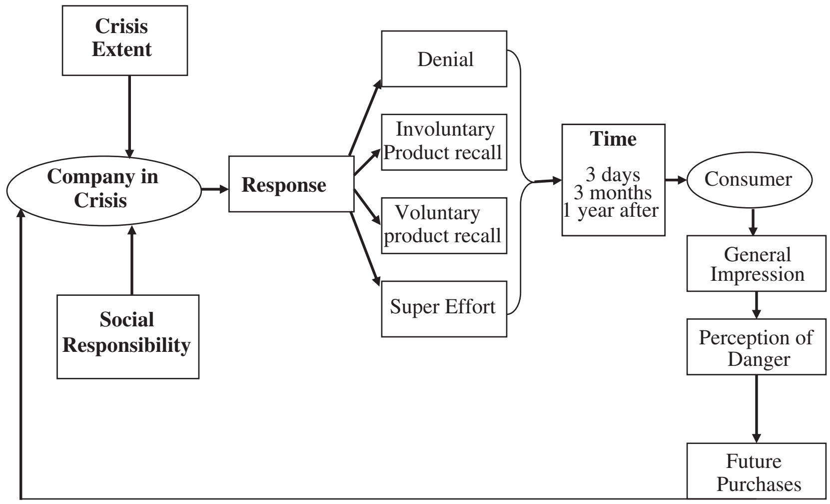

Fig. 1. The conceptual framework.

the company's response is to a super effort in the three different time periods (i.e., 3 days, 3 months and 1 year after the crisis).

Finally, since the greatest proportion of research studies argue that the severity of injuries has an impact on consumer attitudes during a product-harm crisis (Mowen and Ellis, 1981; Tedeschi and Nesler, 1993; Kelly and Campbell, 1997), the third hypothesis could be expressed as follows:

H_3. Given the same levels of organizational response and CSR, the firm's response to product-harm crisis will be perceived by consumers as more successful the less severe the injuries associated with the defect are in the three different time periods (i.e., 3 days, 3 months and 1 year after the crisis).

A schematic summary of the conceptual framework is presented in Fig. 1.

In order to measure consumer perceptions and purchase intention (dependent variables of the model), the following variables are used:

Perceived Degree of Danger: It is measured on a seven-point scale (extremely dangerous/not at all dangerous), "How dangerous do you perceive (the product) to be?" and examines the degree of danger perceived by consumers about the defective product (Siomkos and Kurzbard, 1994).

General Impression of the Corporation: This variable investigated the consumers' perceived general impression of the company involved in the crisis (Jolly and Mowen, 1984; Mowen and Ellis, 1981; Mowen and Pollman, 1981). It is measured on a seven-point scale (favorable/unfavorable): "What is your general impression of (Name) corporation?"

Consumer Interest in the New Model: It examines consumers' purchase intention (Mowen and Ellis, 1981; Mowen and Pollman, 1981). This variable is measured on a seven-point scale (very much interested/not interested at all): "How interested would you be in buying a new model which replaced the defective model?"

Table 1 summarizes the study variables and their levels.

Table 1
Variables used in the present study.

Independent variables	Dependent variables
Crisis extent High Low	Perceived Degree of Danger
Social responsibility High Low	General Impression of the Company
Company's response Denial Involuntary product recall Voluntary product recall Super effort	Consumer Interest in the New Model (Future Purchases)
Time 3 days after the crisis 3 months after the crisis 1 year after the crisis	

4. Methodology

In order to test the research hypotheses, an experiment was conducted by using 48 [(2 levels of crisis extent $\times$ 2 levels of CSR $\times$ 4 levels of company response) $\times$ 3 time periods)] scenarios (treatment groups).

The scenario described a fictitious company (i.e., Power Mobile Communications), which was involved in a product-harm crisis (i.e., defeat mobile phone). The fictitious name was used as the company's name in order to minimize subject bias (Siomkos, 1999). Table 2 presents the levels of the four variables are described through the scenarios.

Totally, 384 respondents were randomly assigned to the 48 treatment groups (8 respondents to each scenario). This number of the respondents for each scenario is reasonable, as according to VanVoorhis and Morgan (2001) seven participants per scenario ensure robustness of results. All respondents were volunteers who agreed to take part in the survey. The convenience sampling method was preferred since questionnaire may be easily and quickly collected and respondents are more cooperative (Malhotra and Peterson, 2006).

Approximately 38% of the participants were men, and the greatest percentage (55%) consisted of university/college

Table 2
Scenarios used in the study.

Variable	Level	Scenario wording
CSR	Low	Mobile Communications produces mobile phones.
	High	Mobile Communications is one of the best-known producers of mobile phones. It has the reputation of being one of the most socially responsible companies. Every year the company donated 7.5% of its profits to philanthropic causes. It is environmentally conscious; it regularly sponsors social and cultural events and the company recently €100.000 in an orphanage. In 2007, Mobile Communications received a prize for its social responsibility.
Time	3 days	Unfortunately, 3 days ago, the lithium rechargeable battery of a specific model was overheated and caused an explosion.
	3 months	Unfortunately, 3 months ago, the lithium rechargeable battery of a specific model was overheated and caused an explosion.
	1 year	Unfortunately, a year ago, the lithium rechargeable battery of a specific model was overheated and caused an explosion.
Extent	High	The explosion caused serious damage. Three people were killed and two were seriously injured.
	Low	The explosion caused damages to the property of three consumers. No injuries or deaths were reported.
Response	Denial	Mobile Communications denied the responsibility for the incident. The company argued that all the appropriate controls had been made and the battery was not found defective. The company declared that the product was safe and that a recall was unnecessary. Finally, the marketing manager said that such events could happen to any product if consumers did not carefully read the terms of use.
	Involuntary recall	Mobile Communications recalled 3000 phones after the Ministry of Health ordered so.
	Voluntary recall	Mobile Communications recalled 3000 phones after the incident. It also disclosed information regarding the crisis.
	Super effort	Mobile Communications immediately recalled 3000 phones with a specific serial number. Their batteries were replaced free of charge. The company made a concerted effort to inform all consumers about the faulty product and the ways that they could be reimbursed. In addition, Mobile Communications compensated the families of the victims. Finally, a 24-h call center was responsible for giving out information.

Table 3
Demographic characteristics of the sample.

Demographics	Percentage (%)
Sex	
Male	37.8
Female	62.2
Age	
18–25	39.8
26–40	36.2
40+	24
Education	
High school	18.2
Undergraduate degree	54.7
Graduate degree	27.1

graduates. Almost 40% of the respondents were 18–25 years old. Table 3 presents the detailed characteristics of the sample.

5. Results

Analysis of variance on the three dependent variables was performed and revealed the results shown in Table 4. The corresponding column with the *F*-ratios indicates that time, CSR and company's response affect consumers' overall impression of the company, perceived danger and consumers' future purchases.

From the above analysis, it may be concluded that time is a significant factor, which affects all dependent variables. Table 5 presents the average values of the three dependent variables across the three levels of time. In a product-harm crisis, consumers will perceive the degree of danger associated with the defect as relatively high when the crisis has just occurred (i.e., 3 days after the incident) (average danger = 3.01). The average of perceived danger decreases as time passes (average danger 3 months after the crisis = 3.34; average danger 1 year after the crisis = 3.94). Moreover, consumers tend to have a better impression (average = 4.05) 1 year after the crisis compared to the other two time points (i.e., 3 days and 3 months after the crisis). Finally, time affects consumers' future purchases. As Table 5 shows, consumers are more willing to buy a new model from a company a year after the crisis (average = 3.48). Fig. 2 represents the impact of time on consumer attitudes.

In order to investigate in more detail the impact of time, for the four dependent variables that measure the consumer attitudes, four ordinal regression (PLUM) analyses were performed (Table 6).

From the observed significance levels in Table 6, it could be concluded that time is related to the assessment of consumers' general impression, perceived danger after the crisis and their future purchase intention. As time passes, 1 year after the crisis, the odds of intending to buy a new product are 2.62 times greater than 3 months after the crisis. In addition, consumers perceive the product as less dangerous (the odds are 1.74 times greater) as the time passes and they have a better general impression (the odds are 1.99 times greater).

Analysis of variance on the three dependent variables was performed for each time period separately. Table 7, presenting the tests of between subject effects, indicate that 3 days after the crisis, consumers' general impression and perceived danger is significantly affected by CSR and organizational response. Future purchases are influenced by the crisis extent and CSR. On the other hand, 3 months after the crisis, the perceived danger is significantly affected by CSR, organizational response and crisis extent. In that period, future purchases are influenced only by CSR. Finally, 1 year after the crisis, CSR and organizational response significantly affect the general impression, perceived danger and the future purchases.

6. Conclusion

As a product-harm crisis is dangerous for the corporate structure (Stern, 2001) companies should give emphasis on its prevention and confrontation. However, the combating of crises is a complex and difficult procedure. In those situations crucial decisions should be taken within limited time constraint and uncertainty of the outcome (Stern, 2001). Consequently, managers should be well prepared to effectively face the potential crises (Chong, 2004).

Results of the present study showed that the time span between the first signals of potential injuries and liability and the date when consumers' attitudes are measured seems to be a

Table 4
ANOVA results (*F*-ratios).

Source of variation	General impression	Perceived danger	Future purchases
Main effects			
CSR	56.67*	100.84*	52.46*
Response	15.66*	13.77*	3.03*
Extent	1.18	0.83	0.23
Time	18.06*	13.63*	37.46*
Two-way interactions			
(CSR) × (Response)	1.34	0.41	9.67
(CSR) × (Extent)	0.03	1.30	0.56
(CSR) × (Time)	2.91*	0.74	4.80*
(Response) × (Extent)	0.96	1.38	0.47
(Response) × (Time)	0.22	0.47	1.63
(Extent) × (Time)	0.82	1.83	3.03*
Three-way interactions			
(CSR) × (Response) × (Extent)	1.08	0.19	0.16*
(CSR) × (Response) × (Time)	2.53*	2.25*	0.47
(CSR) × (Extent) × (Time)	0.16	0.87	0.94
(Response) × (Extent) × (Time)	1.39	2.94*	1.97
Four-way interactions			
(CSR) × (Response) × (Extent) × (Time)	1.44	1.06	3.96*

* $p < 0.05$.

Table 5
Means for dependent variables across different levels of time.

	Time	Mean
General impression	3 days after	3.219
	3 months after	3.523
	1 year after	4.055
Perceived danger	3 days after	3.086
	3 months after	3.336
	1 year after	3.938
Interest in buying a new model	3 days after	2.219
	3 months after	2.844
	1 year after	3.477

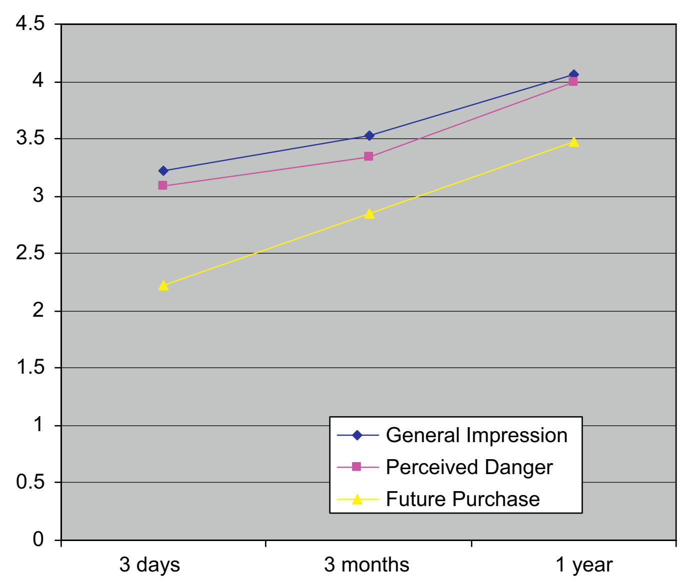

Fig. 2. Consumer attitudes in different time periods.

powerful indicator of when the crisis has passed. A few months after the crisis, consumers are more likely to have a more positive impression, to perceive the product as less dangerous, and to be willing to buy a new product from the same company. Consumers' attitudes are even higher a year after the crisis. Among consumers, the odds of buying a new product from the same company are approximately three times greater a couple of months after the disaster. In the same way, time contributes to perceiving the product as less dangerous (1.74 times greater) and is likely to lead to a generally favorable impression of the harmed company (almost two times greater). As a result, time was found to be the most important factor that influences consumers' attitudes towards a company that has gone through a crisis.

Also, the results of the current study showed that CSR is a crucial factor in the successful dealing with a crisis. Consumers are less likely to perceive a product as danger after the crisis and more likely to form a positive opinion and to make future purchases if the company has demonstrated high levels of social sensitivity. These results are consistent with previous studies' results, which have shown that high reputation and CSR may protect the company's image in times of crises. Moreover, CSR plays an important role in all three time periods that the study examined. Consumers are more likely to "forget" about a crisis and more like to buy a new product when the company involved in the crisis is socially responsible.

Although some studies have demonstrated that the crisis extent affects consumers' attitudes (Mowen and Ellis, 1981) and the placement of blame (Tedeschi and Nesler, 1993), the current study showed that the extent of a crisis does not play an important role in consumers' attitudes and reactions. In general, crisis extent could be only used as a predictor of perceived danger of the defeat product. Conversely, severity of crisis was found to influence purchase intentions only in the first time period, i.e., 3 days after the crisis and was also found to influence the perceived

Table 6
PLUM analysis—the impact of time.

	General impression	Perceived danger	Future purchases
Wald	34.718*	23.477*	63.380*
Expb	1.99	1.74	2.62
Lower 95% confidence interval	1.58	1.39	2.06
Upper 95% confidence interval	2.51	2.18	3.32

* $p < 0.05$.

Table 7
Analysis of variance in the three different time periods.

Source of variation	General impression	Perceived danger	Future purchases
3 days after the crisis			
CSR	37.710*	40.916*	51.772*
Response	5.028*	3.840*	1.363
Extent	0.094	0.189	3.388*
3 months after the crisis			
CSR	15.603*	34.157*	13.278*
Response	5.714*	6.982*	0.708
Extent	2.550	4.603*	2.571
1 year after the crisis			
CSR	8.649*	26.989*	4.477*
Response	5.419*	4.495*	4.137*
Extent	0.461	0.578	0.644

* $p < 0.05$.

danger in the second time period, i.e., 3 months after the crisis. In other words, a severe crisis affects future purchases shortly after the crisis and delays the consumers' forgetting in a middle period (3 months) after the crisis.

As organizational crises can cost millions of dollars in sales or market share, companies should be well prepared to cope with crises. Companies need to have a crisis plan that will go into effect right after the crisis. The plan should be tested regularly so as to ensure that no time will be lost. After the crisis, the voluntary recall of the product (i.e., simple voluntary recall or super effort), may help the company to minimize its losses. The losses could be also decreased if the company already has a socially responsible profile.

A few months after the crisis, consumers tend to return to their pre-crisis attitudes towards the company. This evidence could be soothing for companies who believed that crisis consequences are permanent and non-reversible. However, even 3 or 4 months of waiting until the turbulence stops, may be crucial and destructive. Companies should try to accelerate its recovery period by constructing a strong and socially responsible image and by voluntarily recalling the faulty product. The super effort technique could be a shield against profound damages, and also accelerate a smooth and complete recovery.

7. Limitations and directions for further research

This paper measures consumer attitudes towards a company that went through a crisis in three different time periods. Since time was found to be significant in confronting crises, it would be very interesting to take measurements in more time periods, so as to find the critical point (after how many days or months are consumers more likely to "forget"?). It would also be worthwhile to measure consumer attitudes at different intervals after a real crisis. The real event instead of hypothetical crisis through scenarios may bridge the gap between intentions and behavior. Further research may be focused on other product categories (i.e., juice, yogurt, electrical appliances) or services (i.e., hospitals, restaurants) and measure the impact of time in such crises (e.g., after how many days or months would consumers be willing to visit the same restaurant or buy the same brand of yogurt). A cross-cultural study would also be able to detect differences in consumers' attitudes as the impact of time may vary across cultures.

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