Original Article

The importance of factors influencing product-harm crisis management across different crisis extent levels: A conjoint analysis

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ABSTRACT Product-harm crises can seriously impact the viability of a company. By considering the factors that affect the outcome of a crisis, organisations could manage crisis situations to minimise negative consequences. The aims of this paper are to (a) examine the importance of each factor of product-harm crises (that is, corporate social responsibility, organisational response, time and external effects) influencing consumer purchase intentions and (b) study variations in the purchase intentions across three different crisis extent levels. In order to investigate trade-offs and the relative importance of the above factors, conjoint analysis is used. The results reveal that organisational response and time are the most important factors in high- and medium-extent product-harm crises, whereas social responsibility and external effects mostly influence consumer purchase intentions in severe crises. Based on the importance of the factors, managerial implications are discussed.

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INTRODUCTION

A crisis is an event developed through complicated processes, that causes extended

damages¹ and potentially affects an entire organisation.² Although crises have a low probability of occurring,³ they may have severe consequences for a company if not handled properly.^{4,5} Many definitions accept that a crisis may even threaten the survival of a company.⁶ Some of the most common consequences of crises are decrease in sales and market shares⁷ or widespread negative publicity.⁸ Crises are often difficult to anticipate and, realistically, to prevent; this is why many researchers emphasise on pre-crisis management practices⁹ such as risk analysis, efficient training of crisis management units and so on.

Crises are events that are difficult for a company to avoid. The types of crises are numerous, varying from 'small-scale organisational issues' to grave crises caused by external factors, such as earthquakes and fires,² and may happen to any company at any time.^{10,11} A crisis can cause negative publicity, which in turn affects consumers' attitudes, beliefs and future purchases.⁸ Therefore, managers should be effectively prepared to deal with crises.¹² This preparation may include the development of a suitable communication strategy.^{13,14}

Product-harm crises, which are connected to defective or even dangerous products, are among the most common threats to a company.¹⁵ They can be defined as a sudden break in a product's life cycle,¹⁶ variously caused by such problems as the manufacturer's negligence or product misuse. Product-harm crises could result in immense financial costs for a company. Product recalls are one of the possible ways a company can confront such crises.¹⁷ However, despite the disturbing impact of product-harm crises, little systematic research has focused on consumer reactions or their marketing consequences.

Past literature on product-harm crises has identified four factors that involve product harm and affect consumers' responses to company crisis situations: the company's reputation and social responsibility,^{18–20} the company's response to the crisis,^{18,21} the number and degree of injuries^{22,23} and the external effects during and after the crisis.^{16,24} Although there are other factors that may also affect consumer responses (for example,

brand loyalty, pre-crisis category usage and advertising,²⁵ attributions of responsibility and blame¹⁸ and so on), the four above-mentioned factors (that is, the company's response, the company's social responsibility, the severity of crisis and the external effects) are considered to be the most important²⁶ and widely used in the relevant literature.

Apart from these variables, this study also incorporates the 'time' in the model under investigation. Crisis has been characterised as an important variable affecting consumers' responses in product-harm crises. However, the few studies that have examined this variable define 'time' as the 'time span between gathering initial evidence of a crisis and the recall'.²⁷ In the current study, 'time' is defined as the time that mediates between the crisis and the measurement of consumer responses.

The aims of the current research are twofold: (a) to examine trade-offs and the relative importance of different factors influencing consumer purchase intentions in product-harm crises, and (b) to study variations in purchase intentions across different crisis extent levels.

LITERATURE REVIEW

Standop²⁷ argues that even a company with a good reputation should expect a loss of reputation after a crisis, both with and without a recall. Other studies have shown that a company's reputation significantly affects the degree to which a company is successful in dealing with the crisis.^{16,19,28} Siomkos²⁸ concluded that companies involved in a crisis are more likely to be held responsible for the defective product if they have a poor reputation. More specifically, it has been shown that a highly respected and well-known company is regarded more favourably in cases of product recalls. Thus, a good reputation could also play a protective role in a product-harm crisis. Linked to reputation, research has also been conducted based on corporate social responsibility (CSR). By incorporating such issues as equal opportunity for employees, environmental protection, philanthropic support and the fair treatment of minorities,²⁹ a company could protect itself against crises, as the reputation that

derives from CSR may protect the company's image.

Some studies on product-harm crises have examined the social and ethical responsibilities of organisations.^{30,31} Shrivastava,³² linking CSR to crisis management and crisis prevention, suggests that companies need to have an adequate conception of CSR in order to respond more effectively to crises. Mowen *et al*¹⁸ argue that a company could limit the negative effects of a product recall if it emphasises that it is acting in a socially responsible manner. Fombrum *et al*³³ also stress that CSR could be considered an effective strategic tool through which companies may decrease or limit the potential vast consequences of a crisis. The CSR variable in the current study contains two levels: high CSR and low CSR.

Response is a stage that a company has to face when a crisis cannot be avoided.¹⁴ When a crisis occurs, a company has to take action so that the crisis can be overcome. A company's response receives publicity through their spokespersons, who usually deliver statements about the crisis. These statements include an account of the company's role in the crisis. Four main types of response have been identified: denial, involuntary recall, voluntary recall and super effort.^{19,21}

When a company prefers the first response type (denial), it simply denies that the product is defective and does not accept responsibility for the crisis. In involuntary recall, a company takes action only after an agency's intervention. Siomkos²⁸ defines involuntary recall as 'simple compliance with the minimum legal requirements'. Voluntary recall includes the disclosure of information regarding the crisis and the recalling of the product before an agency's order. Finally, the super effort response engages the immediate recall of the product, enriched with a strong attempt to communicate a socially responsible image. This response may also include the giving of free samples of another product and special discounts. In addition, the company informs customers about the harmful product and how they can be compensated. Past literature reveals that consumers are much more likely to form a positive opinion about a company when the super effort response is used.^{19,21} These four

responses comprise the levels of the variable named 'company response'.

External factors, such as the press that monitors the crisis, influence a company's ability to communicate with its stakeholders, and significantly affect the effective management of crises.²⁸ According to Jolly and Mowen,²⁴ the negative effects of a crisis may be diminished by the press if the involved company is acting in a socially responsible way. Siomkos and Kurzbard¹⁶ concluded that when the external effects of the press are positive during a product-harm crisis, consumers are less likely to perceive the degree of danger, and future purchases are less likely to be influenced by the crisis. The 'external effects' variable in this study contains two levels: positive and negative.

Although time seems to be an important factor influencing consumer attitudes toward a company involved in a crisis, there is a lack of studies examining this factor. Standtop²⁷ emphasises on the role of time in product-harm crises. The results of his study show that the time span between the first signals of potential injuries and the actual date when the recall is set in action is very important. He concluded that a short span (no delay or hesitation) could be seen as responsible action. However, the current study approaches time from another perspective, that is, different time periods after the crisis.

The four above-mentioned factors (CSR, organisational response, external effects and time) can be considered 'controllable' factors. More precisely, a company may invest in building a socially responsible profile, place emphasis on communicating with the media, immediately recall products or wait for time to pass. The severity of harm is a very important factor influencing consumer attitudes and purchase intentions. Nevertheless, companies are unable to control this.

Although some studies found that the severity of harm does not significantly affect consumer outcomes (for example, Lee³⁴), most researchers agree that the severity of harm, that is, the number and severity of injuries or deaths, affects consumers' reactions and attitudes. For example, Mowen and Ellis²³ found that a company in a

Figure 1: Conceptual framework.

high-injury crisis case condition is perceived less favourably than a company in a low-injury situation. Other studies have also proposed that the severity of injury affects the placement of blame and responsibility.³⁵

As the extent of a crisis, it is categorised as uncontrollable crisis extent, which is not included in the analysis as an independent variable. Previous research studies, which investigated the impact of crisis severity, used two or three levels of crisis extent. For example, Coombs³⁶ creates two levels of crisis extent: minor (with trivial damage) and severe crises. Lee³⁷ also divides crises into two categories according to their severity in order to consumer outcomes. Furthermore, Mowen and Ellis's study,²³ which focused on a faulty coffee, used two levels of crisis extent, that is, low (minor burns) *vs* high (two deaths). On the other hand, Park,³⁸ who studied health-related crises, separated crises into three categories based on their severity. Three levels of crisis extent were also used by de Marchi.³⁹ Finally, Collins⁴⁰ separated crises into three groups, that is, high-, medium- and low-extent crises. In this study, three different control groups (scenarios) were formed based on three levels of the severity of harm (high/medium/low).

In each group, the four main factors (CSR, organisational response, external effects and time) that influence purchase intentions were analysed separately. Consumer interest in the new model (purchase intentions)^{23,41} was measured on a

100-point scale. Figure 1 presents the conceptual framework of the study.

METHODOLOGY

In order to examine the relative importance of different factors and to study variations in purchase intentions across different crisis extent levels, conjoint analysis was used. Conjoint analysis is a technique used to estimate how respondents develop preferences for products, services or ideas (real or hypothetical), and to measure the trade-offs consumers make when making a decision.⁴²

Conjoint analysis was preferred, as it allows for a more realistic decision model, because it forces subjects to evaluate a crisis as a whole (exactly as in real life). Also, it permits statistical testing of the null hypothesis that all the attributes have an equal utility in the aggregate model.⁴³

The basic model in the conjoint analysis is $Y = b_1 + b_2 + b_3 + \dots + b_n + \text{constant} + \varepsilon$ where Y is the consumer purchase intention, b is the beta weights (utilities) for the crisis factors and ε is an error term.

The stimulus set is a combination of four attributes and attribute levels (independent variables), which is presented to each respondent. The stimulus set is presented in Table 1. The full-profile approach to data collection was used.

Thus, in this study, there are $2 \times 4 \times 2 \times 3 = 48$ manipulations. Conjoint analysis decreases the number of manipulations considerably (in the present case, the number of product descriptions

Table 1: Factors and levels used in the conjoint

<i>Factor</i>	<i>Levels</i>
CSR	High Low
Response	Denial Involuntary recall Voluntary recall Super effort
External effects	Positive Negative
Time	3 days after the crisis 3 months after the crisis 1 year after the crisis

decreases to 16). In particular, 16 design cards, ready to be used for utility calculations, were prepared after the completion of the orthogonal analysis matrix. An alternative orthogonal analysis matrix was used to develop four holdout (control) cards. Thus, 20 evaluation cards were developed to be used by respondents. A 100-point rating scale was used for dependent variable measurement. End points of the scale were identified as 'not interested at all' and 'extremely interested'. In conjoint analysis, for each respondent the coded attribute combinations were regressed using ordinary least square.

The conjoint cards were distributed by the researchers to respondents. Each respondent was asked to evaluate the 20 cards of one scenario (that is high, medium or low crisis extent). The scenario described the crisis of a fictitious mobile phone company (that is, 'Mobile Power'). The exact wordings for each level used in the scenarios are presented in Table 2.

The interviewer described the scenario to each respondent. For example, for the first scenario (high crisis extent) the interviewer mentioned that the cards referred to a crisis where four

people were killed and 10 were seriously injured. Figure 2 presents an example of a card handed out to respondents.

In total, 288 cards were evaluated and used for further analysis. Table 3 portrays the demographic characteristics of the sample.

RESULTS

For high crisis extent (severe injuries and deaths), time was found to be the most important factor in determining consumer purchase intentions. Organisational response was also of considerable importance (Figure 3). Within the factor of organisational response, super effort was found to be the most important as compared to voluntary recall, forced recall and denial.

Table 4 presents the utilities estimates (part worth) and importance values for the first scenario (high extent of crisis).

The results of medium-extent factor rankings are presented in Table 5 and Figure 3. Organisational response was found to be the most important factor in determining consumer purchase intentions. However, external effects were found to be considerably less important than the other three factors.

For low crisis extent (only insignificant damages, no injuries or deaths reported), CSR was found to be the most important factor (Table 6 and Figure 3). Nevertheless, external effects and CSR are very closely grouped, with very small differences between importance values.

Figures 4–7 comparatively present the individual subject utilities for the three crisis extent levels.

An overall importance score was calculated to determine what the most important attributes were, as presented in Table 7.

MANAGERIAL IMPLICATIONS

By considering the factors that affect purchase intentions, organisations could manage crisis situations to minimise negative consequences. In the real world, consumer decisions include trade-offs when deciding to purchase a product from a company involved in a crisis. The purpose of this study was to investigate the factors found significant by consumers in their decision to

Table 2: Description of the scenarios

<i>Level</i>	<i>Description</i>
CSR – High	'Mobile Power', a company which produces mobile phones, is one of the most socially responsible companies in the country
CSR – Low	'Mobile Power' is a company which produce mobile phones
Time – 3 days	The crisis occurred 3 days ago
Time – 3 months	The crisis occurred 3 months ago
Time – 1 year	The crisis occurred 1 year ago
Response – denial	The company denied the responsibility
Response – involuntary recall	The company recalled the product after the intervention of the Ministry of Health
Response – voluntary recall	The company voluntarily recalled the product
Response – super effort	The company immediately recalled the product, informed all future customers for potential risk and compensated the victims
External effects – positive	The media positively commented on the company's manipulation
External effects – negative	The media negatively commented on the company's manipulation

Scenario A: The Interviewer describes the high extent level of the crisis

"Mobile Power" is one of the **most socially responsible companies in the country**.

The crisis occurred **3 days ago**.

The Company **denied** the responsibility.

The Media **positively** commented on the Company's manipulation.

How interested would you be in buying a mobile phone from "Mobile Power"?

0 10 20 30 40 50 60 70 80 90 100

Definitely would not buy Definitely would buy

Figure 2: Example of conjoint cards.

Table 3: Demographic characteristics of the sample

	Gender		Age		
	Males (%)	Females (%)	18–25 (%)	26–40 (%)	41+(%)
Scenario A: high crisis extent <i>n</i> =99	40.9	59.1	27.8	44.6	27.6
Scenario B: medium crisis extent <i>n</i> =93	44.1	55.9	22.0	48.2	29.8
Scenario C: low crisis extent <i>n</i> =96	48.5	51.5	26.4	43.9	29.7

purchase after a product-harm crisis. One of the most interesting findings of this study was the variation in the important values and rankings across the three different levels of crisis extent.

In the first scenario, respondents were informed that the crisis led to very serious injuries and deaths. In this situation (high crisis extent), time was found to be the most important factor. A few months after a severe crisis, consumers tend to forget the consequences. This evidence could be soothing for companies who believe that crisis outcomes are permanent and non-reversible. However, even 3 or 4 months of waiting until the turbulence stops may be destructive. Companies should try to accelerate their recovery periods. The super effort technique could be a shield against profound damages, and also accelerate a smooth and complete recovery. For harsh crises, the effort needed for constructing a strong and socially responsible image may be less important, as the emphasis should be placed on response and time. For a couple of months after a crisis, companies should be prepared for a decrease in sales and market shares. In addition, the role of

Figure 3: Individual subject importance.

the press (external effects) is weak, as the negative effects of a crisis are not alleviated by the media when it is reported that the company involved is acting in an honest and responsible way.

For medium-extent product-harm crises, organisational response was found to be the most

Table 4: Results for high crisis extent

	Utility estimate	Rank
CSR		
Importance value = 9.183		
Low	-3.503	3
High	3.503	
Organisational response		
Importance value = 40.268		
Denial	-13.409	2
Forced recall	-11.381	
Voluntary recall	7.482	
Super effort	17.308	
External effects		
Importance value = 7.376		
Positive	-2.813	4
Negative	2.813	
Time		
Importance value = 43.173		
3 days	-18.692	1
3 months	4.451	
1 year	14.241	

Table 5: Results for medium crisis extent

	Utility estimate	Rank
CSR		
Importance value =3.811		
Low	-1.450	3
High	1.450	
Organisational response		
Importance value =68.156		
Denial	-25.630	1
Forced recall	-13.719	
Voluntary recall	13.109	
Super effort	26.241	
External effects		
Importance value =0.562		
Positive	-0.214	4
Negative	0.214	
Time		
Importance value =27.471		
3 days	-12.305	2
3 months	3.702	
1 year	8.603	

crucial factor influencing consumer purchase intentions. Results of this study showed that the company's response is, in fact, an important determinant of consumers' attitudes and opinions about the company involved in the crisis. The importance of organisational response has also been pointed out by other research studies.^{19,21}

Table 6: Results for low crisis extent

	Utility estimate	Rank
CSR		
Importance value = 36.249		
Low	- 16.469	1
High	16.469	
Organisational response		
Importance value = 14.582		
Denial	- 8.434	4
Forced recall	- 0.689	
Voluntary recall	4.308	
Super effort	4.816	
External effects		
Importance value = 32.833		
Positive	- 14.917	2
Negative	14.917	
Time		
Importance value = 16.336		
3 days	- 7.103	3
3 months	- 0.637	
1 year	7.740	

These studies concluded that consumers are much more likely to form a positive opinion about a company and buy a new product when the super effort response is used. For medium-extent crises, time was found to be the second-most important factor. This indicates that companies should voluntarily recall faulty products (the recall may also include promotions such as offering special discounts and coupons or free samples of another product), but also realise that time will probably smooth the troubled situation after a couple of months.

On the other hand, CSR and external effects were found to be the key factors for coping with a low-extent crisis. As crises that involve trivial injuries or damages are more likely to occur, companies should invest in social responsibility. When a company demonstrates high levels of social sensitivity, future consumer purchases are less likely to be negatively affected by the crisis. As a result, companies should place emphasis on their social profiles.

Finally, in low-extent crisis situations, companies should also pay attention to media coverage. Previous research has emphasised the role of the press and its impact on a company's effort in dealing with a crisis, as the negative

Figure 4: Utilities for CSR.

Figure 6: Utilities for external effects.

Figure 5: Utilities for organisational response.

Figure 7: Utilities for time.

effects of a crisis may be reduced by the press.^{16,24} In addition, other studies have investigated the role of the message source^{7,8} and the type of media coverage.⁷ During a crisis, company spokespersons typically deliver statements about the crisis (for example, during media conferences or *via* media releases). These statements commonly contain an account of the company's role in the crisis, designed to minimise responsibility. A responsible spokesperson should be adequately trained and prepared to cope with aggravating circumstances.

In the product-harm crisis management literature, a few studies have shown that the type of product is insignificantly connected to the factors influencing consumer's attitudes, responses and purchase intentions. For example, Siomkos and Kurzbard¹⁶ investigated three key imperatives that may lead to negative consequences (that is, company's reputation, external effects and company's response) for two product categories (that is, hair dryer and apple juice). The authors concluded that the two product categories are affected by the same factors. Hooker *et al*⁴⁴ also

Table 7: Relative importance of factors

<i>Factor</i>	<i>Relative importance (equals 100% total)</i>	<i>Overall rank</i>
CSR	16	3
Organisational response	41	1
External effects	14	4
Time	29	2

found that consumers are affected by the same factors in two different products based on the study examined (meat and poultry). As a result, managerial implications of the current study could also be applied in other product categories.

As organisational crises can cost millions of dollars in sales or market share, companies should be well-prepared to contend with crises. Companies need to ensure that they have a crisis plan that will be used after the crisis.³⁴ Based on the results of the current research, the crisis plan could contain more precise suggestions varying across the different levels of crisis extent.

DIRECTIONS FOR FURTHER RESEARCH

This paper examined the relative importance and ranking of factors that influence purchase intentions in product-harm crisis management. Future research could go a step further and examine the optimal allocation of the crisis management budget through simulations. It would also be interesting to determine the likelihood of each crisis extent type (that is, high, medium and low) occurring. Understanding this could help crisis management plans to be more accurate. Finally, future research could segment consumers according to their perceptions. Based on the segments, appropriate crisis management strategies could be proposed.

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