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# Digital crisis management: how proactive online engagements on patient complaints influence social media users' perceptions

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This study investigates how a pharmaceutical company's responses to patients' complaints regarding side effects affect social media users' evaluation of a paracrisis situation. An online study was conducted by simulating a real-world paracrisis situation in which patients petitioned about the serious side effects of a drug on the pharmaceutical company's Facebook page. Results showed that users who are actively engaged with social media reacted more positively when the pharmaceutical company proactively responded to a paracrisis situation. In particular, user engagement moderated the effects of company engagement on perceived crisis likelihood. In turn, perceived crisis likelihood mediated the interaction effects on users' intention to spread negative eWOM and purchase intentions. Thus, this study highlights the importance of proactive engagement by demonstrating the mitigating effects of precrisis engagement when an organization faces a potential crisis situation on social media. It adds theoretical implications to crisis communication literature and provides practical implications as to how online negative events might be managed to minimize negative consequences.

## KEYWORDS

online engagement, paracrisis, side-effect complaints, moderated mediation, crisis communication

## Introduction

Social media users' negative reactions not only indicate dissatisfaction with products or corporate behaviors, but also serve as a warning signal for threats to corporate reputation (Ward and Ostrom, 2006). Social media provide a variety of platforms where users can petition or voice complaints, both in synchronous and asynchronous manners. These negative reactions remain on social media platforms for a prolonged period posing an ongoing risk of eroding brand or corporate reputation and shaping the relationship with consumers (Iglesias et al., 2020). Online reviews and complaints play a pivotal role in assessing the quality of services in the healthcare sector (e.g., Lin et al., 2020). Additionally, corporate reputation influences physicians' prescription decision-making process in the pharmaceutical industry (Ion et al., 2020). Considering the frequent criticisms directed toward the pharmaceutical industry, particularly regarding the deceptive tactics and misleading advertising (Betts et al., 2021; Chen et al., 2017; Kessel, 2014), it becomes imperative for pharmaceutical companies to be attentive to reviews and complaints (Ion et al., 2020).

Negative reactions to a product performance or corporate behaviors at times can quickly gain momentum and develop into a crisis situation. As Spector (2019) points out, crises are not events that wait to be simply acknowledged and managed; they are urgent claims that require immediate action (p. 16). Coombs and Holladay (2012) suggested that consumer petitions can become a crisis when the "concern" becomes highly visible and is voiced by a

wide array of consumers. The publicized expression of concern amplifies the public exposure of complaints and may even lead to a subsequent increase of future complaints (Golmohammadi et al., 2021). Although not all consumer petitions would evolve into crises, some may become a “paracrisis,” which is defined as “a publicly visible crisis threat that charges an organization with irresponsible or unethical behavior” (Coombs and Holladay, 2012, p. 409). A paracrisis is not yet a crisis but a *crisis threat* that has the potential to develop into a full-fledged crisis. A paracrisis does not require an organization to activate a crisis management team or operate in a crisis mode (Coombs, 2023). However, it is a reputational threat that the company must handle within the framework of crisis management (Lee and Lee, 2021; Coombs, 2023). An example of a paracrisis is Pepsi’s 2017 global advertising campaign that featured Kendall Jenner promoting a message of peace in the midst of a confrontation between police officers and demonstrators. As soon as Pepsi launched the advertising campaign on television, it backfired, and many consumers spoke out angrily on social media and accused Pepsi of trivializing racial issues. In this case, Pepsi analyzed the situation, canceled the campaign, and swiftly apologized, preventing a potential crisis without fully mobilizing a crisis management team.

When consumers express concerns about products or corporate behaviors on a company’s social media site, the company’s responses can influence how social media users perceive the negative event that prompted the concern. Even if consumers ultimately find a company’s responses unsatisfactory, they are likely to evaluate the company’s efforts to respond more positively than when the company does not respond at all (Kim and Lim, 2020). Engaging with consumer petitions allows companies to proactively address the early warning signs of potential crises and implement de-escalation strategies (Herhausen et al., 2022). This approach serves as an effective crisis management strategy for preventing crises from fully materializing. Even when consumer petitions develop into a crisis situation, companies could lessen the negative impact if they engaged with consumer petitions from the beginning (Coombs, 2023; Lee and Lee, 2021). Scholars suggest that crisis communication research has traditionally focused on the crisis stage, whereas crisis prevention in the pre-crisis stage has received relatively less attention (e.g., Coombs, 2023; Lee, 2016; Lee and Lee, 2021; Sellnow and Seeger, 2021). In particular, few empirical studies have sought to understand the consumers’ cognitive and behavioral processes in response to companies’ crisis prevention efforts at the onset of crisis signs. The paracrisis framework by Coombs and Holladay (2012) focuses on crisis prevention and emphasizes the role of company engagement when early crisis signs appear. It distinguishes paracrisis response strategies from traditional crisis response strategies (Chen and Holladay, 2023).

This study examined how a pharmaceutical company’s engagement with patient complaints and social media users’ online engagement tendencies influence the social media users’ behavioral intentions in a paracrisis context. Based on an actual side effect warning issued by the Food and Drug Administration’s (FDA), we simulated a real-world paracrisis situation involving patients’ serious petitions about a drug’s side effects. We also tested a moderated mediation model to illustrate how perceptions of the crisis likelihood mediate the relationship between the company engagement and viewers’ social media engagement tendency interactions and behavioral intentions. This study adds to our understanding of the effectiveness and necessity of preemptive actions facing a potential

crisis situation by examining the psychological mechanism of a precrisis event and gives implications to practitioners as to how a precrisis event among consumers should be managed.

## Theoretical background and hypothesis development

### Consumer petitions as a paracrisis

While crisis preparation generally focuses on expected crises and involves passive crisis communication strategies, crisis prevention strives to avert crises and involves proactive crisis communication strategies during the pre-crisis stage. Paracrisis is a crisis communication framework centered on crisis prevention in a social media context. Coombs and Holladay (2012) explicated the paracrisis as a theoretical framework and explained how it can be assessed using three underlying conceptual components: power, legitimacy, and urgency. *Power* refers to the ability of stakeholders to influence and damage the reputation of an organization when it does not comply with or respond to their petition. *Legitimacy* refers to whether other consumers also see the behavior of the organization as negative or problematic. For a paracrisis to be legitimate, other stakeholders must either agree or conform to the petition proposed by the consumer. *Urgency* refers to the stakeholders’ willingness to act or the commitment to pursue change. Lack of willingness to act or commitment to pursue change on the part of the stakeholders will likely prevent the problematic behavior of the organization from developing into a crisis. In Pepsi’s 2017 global campaign, stakeholders had the ability to damage the brand’s reputation (i.e., power) and they complained that the advertising campaign was a corporate misdeed (i.e., legitimacy). The incident quickly spread, and the stakeholders vowed to act against Pepsi on social media (i.e., urgency). Thus, the Pepsi case exemplifies a paracrisis where the situation could have progressed into a crisis if it had not been properly managed early.

Timely responses to paracrisis are particularly important for organizations. Some warning signs are more severe than others and signal potential crises. Consumers would perceive petitions pertaining to bodily injury or health as very serious and thus, those petitions may carry a greater potential to develop into crises. Examples include petitions regarding a prescription drug’s side effects. Research shows the presence of information about a drug’s side effect could dramatically decrease willingness to take the drug and, therefore, lead to the rejection of an otherwise beneficial treatment (Waters et al., 2017). Further, the patients who actually experience the side effects may complain that their side effects are more serious than what were communicated by the pharmaceutical company. When a pharmaceutical company monitors such complaints, the complaining patients may represent only a small number of those who actually experience the problem and, therefore, the company may not view such an event as a crisis. Such negative event, however, may quickly amplify on social media by attracting others who have experienced similar problems or who perceive the issue as serious (Lee, 2020).

Social media platforms have increasingly become the venue for health-related support among people with experiential similarity (Gage-Bouchard et al., 2016). While social media provides unprecedented platforms for companies to publicize their products and services, they also provide platforms where crises can be easily

triggered. The viral nature of content dissemination may result in contagion (Laufer and Wang, 2018), where negative reactions spread and gain momentum. This contagion effect can have detrimental consequences, including negative reputation spillover (Zimand-Sheiner et al., 2021). Social media users share a sense of social connectedness with other users (Gage-Bouchard et al., 2016) and they often consider information shared by other users, such as online comments, as more important than their own (Vernuccio et al., 2015). As such, on social media, even inaccurate information can spread in a fairly unfiltered manner and potentially influence users. It is noteworthy that crises can be triggered not just by a company's misdeeds but also through consumer petitions based on misguided product use or biased interpretation of corporate behaviors. Therefore, handling consumer petitions when potential crisis signs appear is important in preventing crisis escalation regardless of the legitimacy of consumer petitions.

## Company engagement and moderating effect of user engagement

Studies have shown that consumers generally perceive a company's engagement with consumer complaints positively (e.g., Kim and Lim, 2020). Responding to consumer petitions on social media can have a positive impact on consumer satisfaction and influence how consumers perceive a negative event (Cambra-Fierro and Melero-Polo, 2017). Vafeiadis (2023) showed that the more responsive a health care institution is to either negatively- or positively-valanced reviews, the more attractive it becomes to prospective patients. Consumers are less likely to perceive the negative event as problematic when they know the company is aware of and managing their complaints. Such perception may alleviate the urgency to act, and consumers may become less likely to conform to or share the petition, for example, by reducing negative electronic word-of-mouth (eWOM). Responding to consumer petitions on social media not only has the potential to mitigate the negative impact on the individuals directly involved but also to limit the detrimental effects on other consumers (Herhausen, 2020).

Research has also shown that social media users perceive even minor redresses in a positive light, which reduces their intentions to spread negative information (Lee and Lee, 2021). By comparison, not responding to complaints is likely to exacerbate users' anxiety and frustration, and the connectedness of social media will reinforce the ability or power of the users to disseminate negative information (Einwiller and Steilen, 2015). The paracrisis framework emphasizes the importance of early detection and response to emerging reputational threats before they escalate into full-blown crises (Coombs and Holladay, 2012). In digital and social media environments, user engagement, such as comments, complaints, and shares, can serve as an important signal of potential paracrisis situations (Rossmann et al., 2016). Actively engaged users can influence how issues evolve, making their engagement both a trigger and a tool for prevention. Organizations can proactively address concerns raised by users by closely monitoring and responding to user engagement. In this sense, the paracrisis framework is inherently linked to user engagement (Chen and Holladay, 2023), as it emphasizes

understanding and managing stakeholder interactions in real time, particularly on digital platforms (Coombs and Holladay, 2012; Roh, 2017).

However, not all social media users display a tendency to spread negative information on social media. Among many social media user characteristics, user engagement has an important role in increasing and disseminating negative information on social media (e.g., Heinonen, 2018). User engagement can be defined as the intensity of social media users' participation in online discussions, which involves interactive experiences between the user and online content (Calder et al., 2016; Hollebeek and Macky, 2019). Users who are highly engaged tend to be more vocal whereas less engaged users tend to be passive in expressing their opinion on social media (Heinonen, 2018). The engagement tendencies can also illustrate users' online behaviors. For example, less engaged users tend to read or lurk other users' comments, while highly engaged users tend to actively post comments on social media (Kim and Lim, 2020). These online behavioral patterns reflect users' offline traits and personalities and tend to be consistent over time (Scott and Ravenscroft, 2017). Importantly, different user engagement tendencies can influence behavioral outcomes when processing negative events such as consumer petitions.

While a variety of measures have been used to assess online user engagement, commenting is a frequently used measure across social media, including Facebook (e.g., Hong et al., 2017). Commenting or comment activity is a form of active engagement through which users express diverse rational and emotional content (Rossmann et al., 2016). Furthermore, active engagement suggests that a user expends greater cognitive effort to locate pertinent information or present his or her opinion about an issue on social media. By nature, comment activity involves interactive engagement with other users and requires more elaborate cognitive processing (Zheng et al., 2021). Thus, comment activity goes beyond the expression of affect and contributes to information building by encouraging further discussion from other users.

The level of engagement with social media may influence how the users view patient complaints and the pharmaceutical company's responses. Previous research suggests that social media users who are highly engaged in comment activity are more optimistic and positive about their online experiences than lurkers (Zheng et al., 2021). Highly engaged users also seek relevant information or solutions and tend to receive more satisfying answers from comment activities (Zheng et al., 2021). Highly engaged users tend to look for relevant information and make more frequent comments than those who are less engaged. They are also likely to incorporate the company's responses to patients' complaints into the attribution of the event and perceive them as positive efforts to engage with consumers. Thus, engaged users are likely to view the negative event as less serious or problematic. When users do not perceive the negative event as serious, they are less likely to engage in negative eWOM or form negative purchase intentions. In contrast, less engaged users are more likely to discount the response content (Hong et al., 2017), which will make the negative aspects of the event more salient to them. In sum, we expect that users' engagement will moderate the relationship between a company's engagement with patient complaints and behavioral outcomes (see Figure 1 for graphic representation). We, therefore, propose the following hypotheses:

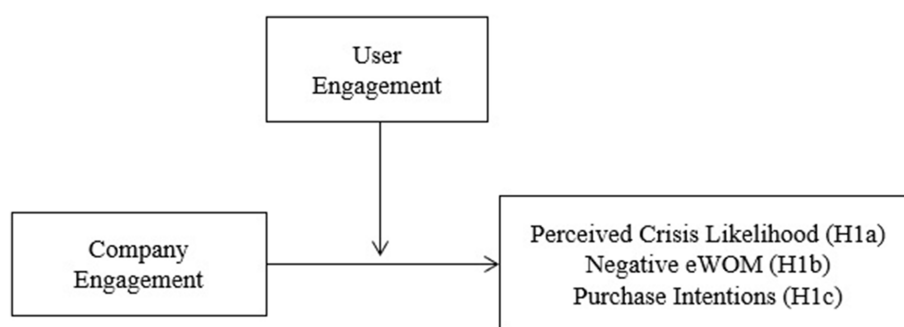


FIGURE 1  
Moderating role of user engagement on the effects of company engagement.

*H1:* The effects of pharmaceutical company's engagement on (a) perceived crisis likelihood, (b) negative eWOM, and (c) purchase intentions will vary as a function of social media user engagement.

likelihood, which, in turn, will influence (a) negative eWOM and (b) purchase intentions.

## The mediating role of perceived crisis likelihood

When people perceive a negative event as a crisis situation, they make causal explanations for the event. As a way of making causal explanations, they can attribute responsibility for the crisis situation, which can eventually lead to attitudinal and behavioral consequences (Lee, 2016; Lee and Lee, 2021). If the attribution process leads people to perceive the company as responsible for the negative event, the resultant behavioral consequences toward the company will not be positive (Coombs, 2023). On the other hand, if people consider the event as less severe or unlikely to become a crisis, it is less likely to negatively influence their evaluations of the company. For example, when patients post serious side effects of a drug on social media sites, social media users who see the pharmaceutical company's responses will positively perceive such engagement. Moreover, they perceive that the pharmaceutical company is in control of the situation or actively addressing the side effect complaints raised by patients. Accordingly, they are less likely to expect the negative event to evolve into a crisis situation. In contrast, users who view the posts without the pharmaceutical company's responses will negatively perceive the company because they will only view negative information about the drug.

Furthermore, social media users' varying levels of online engagement will influence their perceptions of crisis likelihood. Compared to less engaged users, actively engaged users will positively evaluate company engagement by incorporating the pharmaceutical company's responses into their attribution of responsibility for the event, which will reduce their perception about crisis likelihood. Thus, we expect that the perceived likelihood of a negative event progressing into a crisis will mediate the moderating effects of user engagement. More specifically, the interaction effects between company engagement and user engagement will be mediated through users' perceptions of crisis likelihood (see Figure 2 for graphic representation). Accordingly, we propose the following moderated mediation hypotheses:

*H2:* Pharmaceutical company's engagement will interact with social media user engagement to influence perceived crisis

## Method

### Study design and participants

The study was approved by the research ethics committee of the first author's university at the time of data collection. We employed a between-subjects experimental design that manipulated a pharmaceutical company's engagement using the patients' side effect complaints about a drug on Facebook. Past studies used similar designs (e.g., Lervik-Olsen et al., 2016) to achieve a high degree of realism, provided that the scenarios are applicable and appropriate for the same. The second, quasi-experimental factor was the participants' level of Facebook engagement tendencies. This variable was a measured independent variable following earlier studies that measured user engagement on social media (e.g., Alhabash et al., 2015; Hong et al., 2017) and was treated as a continuous variable. A total of 160 U.S. residents over the age of 18 participated in an online study through the Amazon.com's TurkPrime platform. Among them, 11 participants who failed the attention check questions were excluded from the data analysis. Thus, the final sample consisted of 149 participants (55% female, mean age = 36.2). Participants were paid a nominal fee for their study participation and randomly assigned to experimental conditions.

### Stimulus development and manipulation

We drew the stimuli for this study from a real-world case that took place in the U.S. In 2016, the FDA released a public warning on fluoroquinolone antibiotic use for certain uncomplicated infections (FDA, 2016). Fluoroquinolone antibiotic drugs have been used for many years to treat various bacterial diseases, but complaints about side effects gained momentum in early 2016. Patients petitioned consumer advocacy groups and the pharmaceutical companies about the serious side effects. The pharmaceutical companies manufacturing fluoroquinolone drugs, however, did not take noticeable actions addressing patients' petitions. Finally, after a safety review, the FDA issued a public warning in July 2016, which included notification of serious side effects involving tendons, muscles, joints, nerves, and the



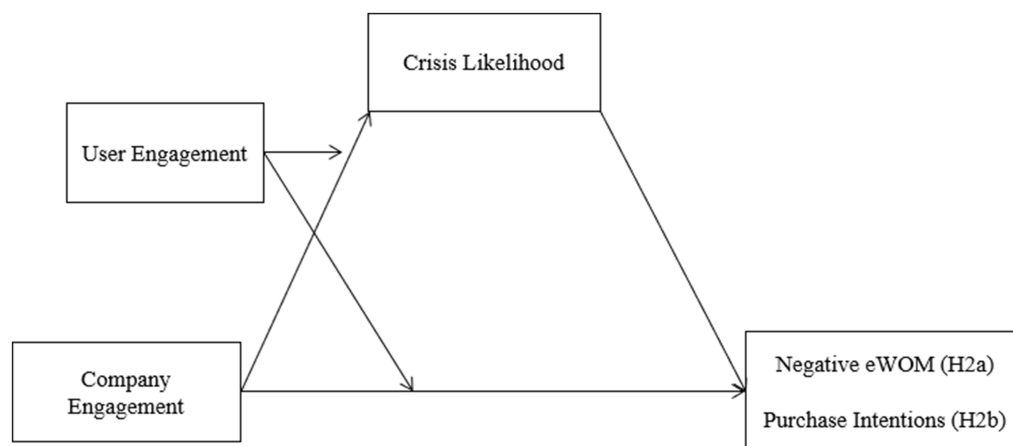


FIGURE 2  
Path diagram of the moderated mediation effects.

central nervous system (FDA, 2016). The fluoroquinolone warning case fit the threshold of the paracrisis guidelines suggested by Coombs and Holladay (2012). For example, stakeholders, i.e., patients, had and demonstrated enough *power* to influence and damage the reputations of drug manufacturers. The case also had *legitimacy* because other stakeholders including consumer groups and doctors also perceived the drug manufacturers' lack of response as problematic. The patient petitions showed *urgency* because the case involved potentially serious bodily injury and fluoroquinolone drugs are widely used.

We used the pharmaceutical company's Facebook page to simulate a paracrisis situation because Facebook is considered a dominant social medium for consumers to post product or service complaints (e.g., Einwiller and Steilen, 2015). Research also showed that pharmaceutical companies actively use social media to communicate with patients and other stakeholders (Gage-Bouchard et al., 2016; Huhmann and Limbu, 2016). The stimulus Facebook website looked like a typical company Facebook page with the pharmaceutical company's fictitious logo on top. The experimental conditions were Facebook posts with (i.e., company engagement condition) or without (i.e., no engagement condition) the pharmaceutical company's responses. In both conditions, the patients posted the symptoms of serious side effects, including severe muscle pain, migraines, flu-like symptoms, and joint aches, which were similar to the 2016 FDA warnings regarding fluoroquinolone use (FDA, 2016). In the company engagement condition, the pharmaceutical company responded to the patients' complaints by expressing remorse about the side effects, explaining the side effects of the drug, and providing advice about how patients could handle the side effect symptoms, which included suggestions to consult with the doctor when symptoms persisted. For example, a patient complained that the drug caused flu-like symptoms and leg pains for 10 days. In its response, the pharmaceutical company apologized for the side effects but said they would disappear within a week if the patient stopped taking the drug. Thus, the pharmaceutical company's engagement included apologies and remedies for the side effect complaints. In the no-engagement condition, however, participants could see only the patients' complaints pertaining to the side effects without the pharmaceutical company's responses.

## Procedure

Upon entering the study website, participants read and agreed to the informed consent, and then, they read the directions, which stated that they would read patients' posts about a drug's side effects on a pharmaceutical company's Facebook page. All participants indicated that they were Facebook users. Participants first answered demographic and media use questions including their Facebook use. They then read the stimulus Facebook page either with the company's responses to patients' petitions or without the company's responses depending on their conditions and answered the questions designed to measure their understanding of the situation. To exclude the participants who may have been exposed to the fluoroquinolone warning case, they were asked at the end of the questionnaire whether they were aware of any fluoroquinolone drug or the FDA warning about the drug. No participant was aware of them. Further, to minimize the possibility of participants' health conditions affecting their responses, we also asked participants whether they had any disease that required any antibiotic drug treatment in recent months. No one answered they had.

## Measures

Before participants saw the stimulus material, these measures first assessed their social media behaviors including user engagement and Facebook use. To gauge participant responses to the stimulus material, we used measures that assessed their perceived crisis likelihood, negative eWOM, and purchase intentions regarding other drugs manufactured by the pharmaceutical company. Lastly, participants answered demographic questions.

### User engagement

Based on earlier studies (e.g., Kseniya et al., 2021; Hong et al., 2017), user engagement was operationally defined as the perceived degree of users' frequency of making comments on Facebook. This was measured using a single-item, 7-point scale ranging from 0 (not

at all) to 7 (very often) ( $M = 3.59$ ,  $SD = 1.68$ )—"How often do you make comments after reading information on Facebook?"

### Perceived crisis likelihood

Operationally defined as participants' perception of the likelihood that the situation would turn into a crisis, *perceived crisis likelihood* was used to assess the severity of the situation. The measure was adopted and modified from Jones et al. (2000), i.e., "In your opinion, how likely is it that this situation will or will not develop into a crisis for the pharmaceutical company?" The scale consisted of four items on an 11-point scale ( $\alpha = 0.91$ ,  $M = 7.02$ ,  $SD = 2.43$ ), anchored by very likely/not likely, not probable/very probable, not possible/very possible, and very certain/not certain.

### Negative eWOM

With *negative eWOM*, we measured the participants' intention to disseminate negative information about the side effects to others online, which was measured by three items on a 7-point scale ( $\alpha = 0.72$ ,  $M = 4.44$ ,  $SD = 1.43$ )—e.g., "I would say negative things about this company to other people" (Coombs and Holladay, 2008).

### Purchase intention

We measured *purchase intentions* using three items on a 7-point scale ( $\alpha = 0.93$ ,  $M = 2.73$ ,  $SD = 1.62$ ), anchored by unlikely/likely, uncertain/certain, and improbable/probable (Bearden et al., 1984).

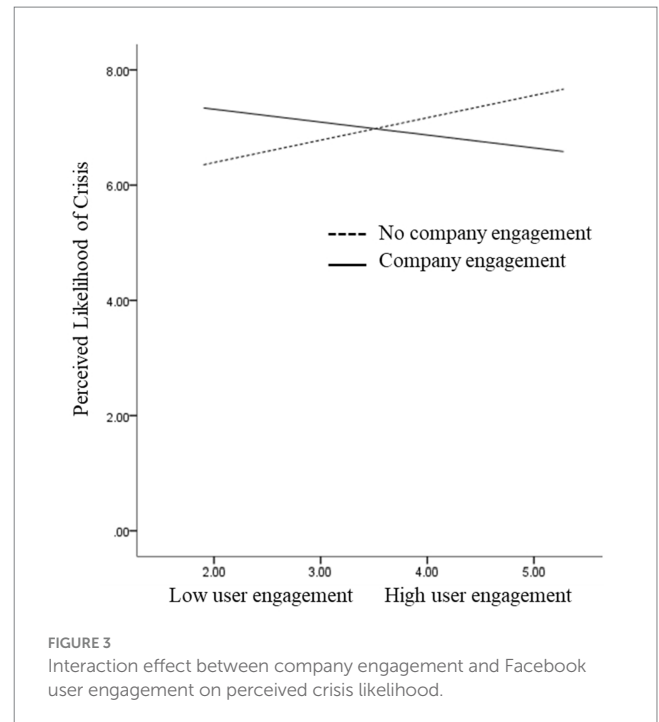
## Results

### Manipulation check

For the company engagement manipulation, two questions asked participants to rate on a 7-point scale (1 = strongly disagree; 7 = strongly agree) the extent to which the company engaged with patients' petitions: "This company actively engaged with patients' petitions" and "This company actively responded to patients' petitions" ( $\alpha = 0.94$ ,  $M = 4.13$ ,  $SD = 2.22$ ). As expected, there was a significant mean difference between the engagement condition ( $M = 5.90$ ,  $SD = 1.05$ ) and no engagement ( $M = 4.13$ ,  $SD = 2.22$ ),  $F(1, 147) = 291.31$ ,  $p < 0.0001$ . Thus, the company engagement manipulation was deemed successful.

### Hypothesis testing

In testing H1(a) regarding the moderating effect of user engagement on the relationship between company engagement and perceived crisis likelihood, the analysis of variance (ANOVA) analysis revealed a significant interaction effect,  $F(1, 145) = 6.80$ ,  $p = 0.01$ , partial  $\eta^2 = 0.05$ . As Figure 3 shows, when the pharmaceutical company responded to the side effects petitions, lowly engaged users were more likely to expect that the negative event would develop into a crisis than when the company responded. For highly engaged users, on the other hand, the exact opposite pattern was found. When the pharmaceutical company responded to the side effects petitions, highly engaged users were less likely to expect that the negative event would develop into a crisis than when the company did not respond.



Following the recommendation of Hayes (2013), we further investigated the conditional effects of company engagement with petitions on perceived crisis likelihood with the Johnson-Neyman technique (Johnson and Neyman, 1936) using Model 1 in the PROCESS macro with 10,000 bootstrap resamples. Specifically, the analysis included company engagement as the predictor, Facebook users' user engagement as the moderator, and perceived crisis likelihood as the dependent variable. The results showed that the 95% bootstrapped confidence bands for the conditional effects of the company engagement on perceived crisis likelihood were entirely below or above zero when Facebook users' engagement tendency was less than 1.4582 or greater than 5.3602. In other words, the results suggest that company engagement significantly influenced the perceived crisis likelihood among those with user engagement scores below 1.4582 and above 5.3602. We found no statistically significant association between company engagement and user engagement on perceived crisis likelihood among those with user engagement scores between 1.4582 and 5.3602. Thus, these results supported H1(a).

Unlike our expectations, however, a series of ANOVA analyses revealed no significant interaction effect between company engagement and Facebook users' engagement on (b) negative eWOM,  $F(1, 145) = 0.62$ ,  $p = 0.43$ , or (c) purchase intentions,  $F(1, 145) = 0.03$ ,  $p = 0.87$ . Thus, the results did not support H1(b) and H1(c).

Although the initial ANOVA analyses revealed limited interaction effects between company engagement and user engagement, Preacher et al. (2007) and Hayes (2013) have posited that in the assessment of indirect effects, X can influence Y indirectly through a mediator even when the analysis finds no significant total  $X \rightarrow Y$  effect. Thus, we ran mediation analyses to test hypothesis 2—that the perceived crisis likelihood would mediate the interaction effects between company engagement and user engagement on (a) intention to spread negative eWOM and (b) purchase intentions. Specifically, we used Model 8 in the PROCESS macro (Hayes, 2013) with 10,000 bootstrap resamples. All analyses included company engagement as the predictor, Facebook

user engagement as the moderator, and perceived crisis likelihood as the mediator. We entered intention to spread negative eWOM and purchase intentions separately as dependent variables for each analysis. Tables 1, 2 show the results of the ordinary least squares regression analysis and the conditional indirect effects, respectively.

The analyses also showed that the indices of moderated mediation were significant: index =  $-0.13$ ,  $BootSE = 0.06$ , 95% CI =  $[-0.2500, -0.0305]$  for negative eWOM; and index =  $0.13$ ,  $SE = 0.05$ , 95% CI =  $[0.0284, 0.2425]$  for purchase intentions. These results suggest that when the company responded to the side effects petitions, highly engaged users were less likely to expect that the negative event would develop into a crisis, which, in turn resulted in less intention to spread negative eWOM and greater purchase intention compared to when the company did not respond. Furthermore, probing the conditional indirect effects showed that the indirect effects on negative eWOM and purchase intentions were significant only when user engagement was high ( $b = -0.2330$ ,  $BootSE = 0.1296$ , 95% CI =  $[-0.5155, -0.0042]$  for negative eWOM;  $b = 0.2239$ ,  $BootSE = 0.1246$ , 95% CI =  $[0.0055, 0.4929]$  for purchase intention). Those low on Facebook user engagement did not show the effect of company engagement on negative eWOM and purchase intention via perceived crisis likelihood. The results, therefore, support the moderated mediation hypotheses H2(a) and H2(b).

## Discussion

Crisis communication is an essential aspect of organization's communication and has significant impact on the reputation and

well-being of organizations and their stakeholders. As such, the findings and recommendations from this research can inform communication strategies and help organizations mitigate the impact of negative events before they could develop into crises. This study sheds light on the role of consumer petitions as a potential source of crisis and the effects of company engagement and Facebook users' engagement tendencies on the perceptions of consumer petitions in a paracrisis context. Specifically, our findings underscore the value of proactive company engagement in mitigating paracrisis situations, especially given the moderating effect of user engagement. By addressing patient concerns regarding side effects, pharmaceutical companies can reduce perceived crisis likelihood, thus preventing escalation. This aligns directly with our aim of evaluating preemptive online strategies in mitigating potential crises arising from side-effect complaints on social media and the impact of user engagement.

The data analyses revealed a significant interaction effect between company engagement and user engagement (H1(a) supported). Highly engaged Facebook users perceived the negative event as less likely to become a crisis when the company engaged with the side effects petitions. Specifically, the follow-up Johnson-Neyman analysis (Johnson and Neyman, 1936) with Model 1 of the PROCESS macro showed that, for less engaged Facebook users, company engagement did not significantly affect the perception of crisis likelihood whereas it did significantly lower this perception for highly engaged users. The significant interaction effect on perceived crisis likelihood is theoretically meaningful because it underscores the importance of perceptions of crisis likelihood in crisis communication. From a stakeholder's point of view, whether consumers perceive an event as a potential crisis situation can be the start of the crisis communication

TABLE 1 Results of the ordinary least squares regression analysis.

Antecedent	Mediating variable model			
	PCL			
	<i>b</i>	<i>SE</i>	<i>t</i>	<i>p</i>
Constant	5.61	0.65	8.62	0.0000
CE	2.15	0.93	2.31	0.0221
UE	0.39	0.16	2.45	0.0153
CE × UE	−0.61	0.23	−2.61	0.0100
Model summary	$R^2 = 0.09$			
	$F(3, 145) = 2.57, p = 0.06$			

Antecedent	Dependent variable models							
	Negative eWOM				Purchase intentions			
	<i>b</i>	<i>SE</i>	<i>t</i>	<i>p</i>	<i>b</i>	<i>SE</i>	<i>t</i>	<i>p</i>
Constant	3.69	0.38	9.68	0.0000	3.05	0.51	6.03	0.0000
PCL	0.21	0.04	5.43	0.0000	−0.21	0.05	−3.94	0.0001
CE	−0.36	0.45	−0.79	0.4300	0.42	0.60	0.70	0.4867
UE	−0.05	0.08	−0.69	0.4918	0.33	0.10	3.25	0.0014
CE × UE	0.04	0.11	0.31	0.7594	−0.15	0.15	−1.00	0.3167
Model summary	$R^2 = 0.19$				$R^2 = 0.21$			
	$F(4, 144) = 7.96, p < 0.0001$				$F(4, 144) = 6.67, p < 0.0001$			

PCL, Perceived Crisis Likelihood; CE, Company Engagement; UE, (Facebook) User Engagement.

TABLE 2 Results of conditional indirect effect analysis.

Conditional indirect effects					
Dependent variable	Mediator	Moderator	Effect	BootSE	Boot 95% CI
Negative eWOM	PCL	Low UE (1.9020)	0.2114	0.1258	[−0.0313, 0.4646]
		Moderate UE (3.5906)	−0.0108	0.0863	[−0.1940, 0.1525]
		High UE (5.2793)	<b>−0.2330</b>	<b>0.1296</b>	<b>[−0.5155, −0.0042]</b>
Purchase intentions	PCL	Low UE (1.9020)	−0.2032	0.1235	[−0.4518, 0.0305]
		Moderate UE (3.5906)	0.0104	0.0824	[−0.1453, 0.1847]
		High UE (5.2793)	<b>0.2239</b>	<b>0.1246</b>	<b>[0.0055, 0.4929]</b>

PCL, Perceived Crisis Likelihood; UE, (Facebook) User Engagement. Statistically significant values are presented in bold. Bootstrap resampling = 10,000.

process (Coombs, 2023). If consumers do not view a negative event as a crisis situation, the communication process can be quite different, which would not significantly affect the company's reputation.

On the other hand, the direct effects of the interaction between company engagement and user engagement were not significant on negative eWOM intentions and purchase intentions (H1(b) and H1(c) not supported). The non-significant direct effects for H1b and H1c may indicate different paths for cognitive (crisis probability) and behavioral outcomes (eWOM/purchases). While user involvement influenced crisis evaluations (H1a), behaviors are likely to entail other mediators (e.g., trust or emotional investment) that are not represented here. Highly engaged users may also perceive lower crisis risk but still share unfavorable eWOM owing to emotional stakes, or purchase intents may need more aggressive actions in high-risk businesses.

However, more importantly, the significant interaction effect on crisis likelihood highlights the importance of moderated mediation analyses as a mirror to understand the hidden relationships among the variables. Indeed, data analyses showed an important role of the perceptions of crisis likelihood for a negative event when examining the relationship between the independent and dependent variables. Specifically, the perceived crisis likelihood mediated the company engagement by user engagement interactions on negative eWOM intentions and purchase intentions (H2(a) and H2(b) supported). The indirect effects, however, were significant only among the highly engaged users. Specifically, highly engaged users showed decreased perceptions of crisis likelihood about the negative event when the pharmaceutical company engaged with patient complaints, and such decreased perceptions about the crisis likelihood led to lower intention to spread negative eWOM as well as higher purchase intentions. In summary, the moderated mediation analyses revealed the paths between independent and dependent variables via crisis likelihood. Without inspecting the role of crisis likelihood, our understanding of the role of paracrisis engagement and user engagement would be limited. As the moderated mediation analyses revealed, demonstrating the role of crisis likelihood—a contextual variable relevant to paracrisis—resulted in a fuller picture of social media users' information processing of a paracrisis situation in health communication.

This study extends the paracrisis framework (Coombs and Holladay, 2012) by empirically demonstrating how proactive engagement may change potential crisis events in digital spaces. We introduce perceived crisis likelihood as a mediator, revealing how user engagement moderates this process, which is a novel integration of cognitive and behavioral dimensions in paracrisis contexts. The

findings advance the paracrisis framework and offer actionable insights into how engagement dynamics shape reputational outcomes.

This research provides practical information for pharmaceutical businesses dealing with a social media crisis. Pharmaceutical firms may use this study's practical findings to manage social media ignited crises. First, the study results suggest that prompt and compassionate early responses to patient complaints can reduce the perceived chance of a crisis. Second, proactive engagement can be a critical factor mitigating a crisis event especially among engaged users, who oftentimes may escalate a potential negative event into a crisis. While these results are specific to the pharmaceutical industry, based on a paracrisis situation in a pharmaceutical firm, they may offer preliminary insights for other industries with high-stakes-reputation risks, such as banking or healthcare. However, further research is needed to determine if the results are applicable to other sectors as different industries operate within distinct business and crisis environments.

This study has some limitations that may hinder generalizability of the findings. First, it simulated a paracrisis situation as an engagement or no engagement by the company, and the company's engagement included an apology and potential solutions to patient petitions. Coombs and Holladay (2012) suggest three response strategies for paracrisis situations: refute, reform, and refuse. The current study used a reform strategy wherein the company explicitly recognized and addressed the problems put forth by consumers. Previous research has shown that different types of response strategies can lead to different results (Roh, 2017; Coombs and Holladay, 2012). For example, if the company fights back or makes excuses against the consumer petitions (e.g., refute strategy), it can be perceived differently by the users. Secondly, while Facebook is a major platform for consumers to voice their opinions and concerns, many users are active across multiple social media platforms, each with its own features, user demographics and interaction styles. Other social media platforms such as Twitter, Reddit and Instagram provide different interface designs, communication norms and content formats that can affect how users respond to content, participate in discussions, or share opinions (Kong, 2025). Thus, the dynamics of user engagement and responses can vary across social media platforms. Third, this study used one specific paracrisis situation for a pharmaceutical company, i.e., drug side effect petitions. As Coombs noted (2023), the crisis type determines how stakeholders attribute crisis responsibility. Stakeholders can attribute different degrees of responsibility to paracrisis situations, which may result in different outcomes. Lastly, the study used a single self-reported item measuring comment activity.



While a single-item measure can be pragmatic (Rossmann et al., 2016; Zheng et al., 2021), it can be limited to capture nuanced dimensions of comment activity.

Future research can expand knowledge of the paracrisis framework by employing different engagement strategies. Depending on the strategies employed, company responses to consumer petitions can backfire or prove ineffective in paracrisis situations (Roh, 2017). Future research may also benefit by incorporating paracrisis dimensions of power, legitimacy, and urgency (Coombs and Holladay, 2012) to better understand the relationships between organization decision-making and stakeholder responses. Researchers should aim to develop specific measures for the three paracrisis dimensions and explore how these dimensions are interrelated or whether each dimension plays an independent role in a paracrisis context. Empirical analysis of the impact of these dimensions on communication outcomes during emerging threats can provide more comprehensive understanding of their influence on perceived authority, credibility, and time sensitivity. Finally, many consumers use traditional and social media platforms on a daily basis. Future studies should investigate the combined effects of traditional and social media for processing negative events.

In conclusion, the findings highlight the importance of considering the perceptions of crisis likelihood in crisis communication and suggest that a company's engagement with patient petitions on social media can help cultivate positive behavioral intentions, particularly among highly engaged users. The study has practical implications for communication managers, who need to acknowledge the increased occurrences of paracrisis and respond to consumer petitions on social media in a timely manner.

## Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

## Ethics statement

The studies involving humans were approved by West Virginia University Research Ethics Committee. Written informed consent was

not required, for either participation in the study or for the publication of potentially/indirectly identifying information, in accordance with the local legislation and institutional requirements. The social media data was accessed and analyzed in accordance with the platform's terms of use and all relevant institutional/national regulations.

## Author contributions

SL: Conceptualization, Methodology, Writing – original draft, Writing – review & editing. SB: Validation, Writing – review & editing.

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## Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

## Generative AI statement

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