Research Article

Model of Negative Emotional Information Communication among Netizens under Corporate Negative Events

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Corporate negative events have been frequently exposed in the information age. Research on the dissemination mechanism of negative emotional information for netizens contributes corporates to monitor public opinion trends and resolve public opinion crises. Combining emotional infection theory and the classic infectious disease model, we first divided emotional communication stage into individual and group propagation stages and constructed the SEIR model of negative emotional information communication among netizens under corporate negative events. Then, we performed the model analysis and simulation. Results indicated that trust and communication conversion rates are in direct proportion to negative emotional diffusion speed; corporate response rate is inversely proportional to negative emotional diffusion speed; however, the effects of self-regulation are insignificant.

1. Introduction

Corporate negative events refer to those that cause negative associations among consumers in the daily production, operation, and service processes of enterprises [1]. With the continuous progress of network technology, the influence of social media has gradually expanded, and negative corporate events, such as “Ruixing Coffee’s Financial Fraud” and “Dripping Windy Car,” have been frequently exposed; the negative emotions of netizens have been fermented and accelerated on media platforms, resulting in the serious damage of company image that has a great negative impact on the future development of companies [2, 3]. Thus, it is important for controlling corporate public opinion to understand the attitudes of netizens when the negative corporate events are outbreaksing in social media.

“Emotions,” as an adaptive response to internal and external stimulations, have an essential role in information dissemination. According to the psychological theory, emotions can be divided into individual and group emotions at the organizational level [4]. Individual emotions are the starting point of emotion transmission, whereas group emotions are driven by the interactive communication among individuals [5, 6]. Under corporate negative events, individuals are prone to dissatisfaction, anxiety, and other negative emotions. Negative emotions, as means of expressing and releasing emotions, easily ferment, accumulate, and trigger emotional resonance in social media, resulting in negative emotional states of network groups, which can easily trigger negative corporate public opinions and form social problems [7, 8]. Therefore, studying the evolution law of netizens’ emotional information under negative corporate events is of great significance for enterprises. Doing so helps them control the direction of the spread of their negative emotions in time to further adopt scientific and effective response strategies. This adoption can help netizens alleviate public opinion crises.

Many scholars have conducted numerous studies on the spread of emotional information among Internet users [9–11]. For example, Hatfield, Cacioppo, and Rapson proposed that emotional contagion is the process by which emotions such as happiness, anger, and sadness are “transmitted” from one individual to another in a short period [9]. Emotional infection not only can change one’s
emotions but also can affect others’ emotions as a signal [12]. Rimé found that emotions are involved in the whole social sharing process [13]. Stiegliitz and Dang-Xuan argued that emotions are an important driver of information diffusion in social media environments, and this driving effect is pronounced in the case of information sharing among Internet users [14]. Ferrara and Yang pointed out that emotions are easily expressed and have long-term effects through social networks [15]. Wang et al. showed that emotions play an important role in individual decision-making processes and that emotional infection has impacts on individual- and group-level behaviors, especially negative emotions [16].

Moreover, many researchers investigated the process of emotion propagation based on the SIR (Susceptible–Infected–Removed) model [17–19]. Liu et al. constructed an SEIR (Susceptible–Exposed–Infected–Removed) model of rumor propagation and simulated the propagation dynamics of rumors in microblogs [17]. Li et al. identified how to direct immunization and social reinforcement effect on positive or negative public opinion through the altered SIR model and dynamic simulation [19]. In a word, current research on emotional communication models has achieved considerable results, which provide theoretical references in the evolution of emotional information and negative opinion guidance [20, 21]. However, few studies have explored the evolutionary process of emotional information dissemination among Internet users in the context of negative corporate events. In addition, most scholars have focused more on information dissemination laws by classifying emotional information types, but less on the evolutionary path of emotional information at different dissemination stages from the perspective of the dissemination process. As the outbreak of negative corporate events often involves the personal interests of consumers, triggering individual dissatisfaction is easy, which, in turn, forms a negative state of group emotion and brings great harm to enterprises and societies. Therefore, controlling the source of group emotional outbursts is important, and specifically dividing different communication stages is necessary to analyze the inner rules of negative emotional information dissemination among Internet users.

The main contributions of the current study are as follows.

(1) From the perspective of research background, the study focuses on emotional information dissemination in the context of corporate negative events.

(2) From the perspective of communication stages, the study divides emotional information dissemination into two stages, individual and group emotional communication, and constructs the SEI₁₁₁₁R model.

(3) This paper analyzes the effects of factors such as emotional self-regulation rate, trust conversion rate, communication conversion rate, and corporate response rate on negative emotional communication.

(4) The model is simulated to provide a reference for subsequent research on the emotion dissemination model and give theoretical basis and practical suggestions for corporate public opinion response.

2. Related Works

In 1926, Kermack et al. constructed the classical SIR model, which was applied to explore the transmission patterns of infectious diseases; the model divided the population into three states: susceptible, infected, and immune states [22]. Subsequently, Anderson, May introduced latent nodes on the basis of the SIR model and proposed the famous SEIR model [23]. Up to now, many scholars have adopted SIR, SEIR, or some other improved models to simulate the information propagation process [24–27].

In terms of emotional infection models, Fu et al. proposed an improved cellular automation–susceptible infected recovered (CA–SIR) model to simulate the dynamic process of emotional infection in a population [28]. The results showed that the movements of individuals accelerate the emotional transmission speed and increase the proportion of infected individuals. The level of group infection can be effectively reduced by controlling the duration of individual emotional infection. Liu et al. proposed an extended SISa model, and numerical simulations revealed that the model is suitable for distinguishing the dynamic process of optimistic and pessimistic emotional infection in a group [29]. Ni et al. constructed the SOSa–SPSa model on the basis of transmission dynamics theory, taking public health emergencies as the background, which simulates the process of group emotional contagion in the whole event by introducing emotional stability nodes [30]. They also pointed out that relevant managers can control their spontaneous infection processes by adjusting the proportion of initial negative emotions. Zeng and Zhu constructed an emotion communication model and simulated the dynamic propagation process of the evolution of individual emotions to group emotions [31]. They found that mood generally changes from negative to positive or is immune through the effective refutation of rumors by the government. On the basis of the SIR model, Mao et al. constructed a CA–SIRS emotion contagion model by meticulously dividing different individuals’ characteristics from the perspective of unexpected public events to provide insights into the control and guidance of negative emotion propagation in virtual network communities [32]. Lv et al. argued that emotions are believed to play an important role in decision making [33]. A population was divided into two categories according to psychological theory, the process of panic spread among the population in emergency situations was discussed, a nonlinear SIRS panic spread model was constructed, and the spread process of group emotional contagion through simulation was described. Li et al. argued that emotions not only spread among individuals but also in large areas on a group scale [34]. A two-factor information propagation model, which considers multidimensional characteristics, was introduced. Specifically, the evolution of the emotional state of a group of Internet users under the additive effect of negative emotions was considered in this model. The results emphasized that the effective control of individual emotion can reduce the propagation risk of the crowd emotion in information propagation. Table 1 depicts the summary of existing emotional infection models.
3. Materials and Methods

In the information dissemination era, the advancement of mobile terminal devices and network technologies has made information dissemination faster and more convenient than before, resulting in various information and uneven quality levels, among which no lack of false information. Along with the explosive growth of information and the need to screen information, the attitude of Internet users toward information is no longer limited to the three states after receiving information, they mostly hold a wait-and-see attitude to follow the development of events. Therefore, this study adopts the SEIR model to classify emotional information disseminators into five groups, namely emotional susceptible (S), latent (E), individual disseminator (I₁), group disseminator (I₂), and immune (R).

Specifically, S indicates that Internet users have received negative corporate information without negative emotions but are highly susceptible to the emotions of other Internet users; E means that Internet users have received negative corporate information, have negative emotions, and choose to pay attention to the development of events without spreading them for the time being; I₁ indicates that individual Internet users are influenced by negative corporate events to generate negative emotions and spread them; I₂ means that negative emotions in the network keep fermenting, emotional intensity keeps accumulating, and emotions are spreading on a group scale; R indicates that Internet users no longer pay attention to negative corporate events and do not spread emotional information.

The specific dissemination process of negative emotional information of Internet users under negative corporate events is illustrated in Figure 1. λ indicates the probability of emotional susceptible people transforming into latent communicators in the network environment; 1 − λ means the probability of emotionally infected people transforming into individual communicators; α₁θ represents the trust factor, the extent to which Internet users believe in the authenticity of a negative corporate event after being exposed to it; considering that individuals have a certain emotional self-regulation ability [29], α₂ means the probability that latent communicators are transformed into the immune state through emotional self-regulation; β₂ indicates the probability that individual disseminators are transformed to the immune after being guided by a firm response strategy; β₁ means the probability of accumulating emotions of individual disseminators to a certain level to transform into group disseminators; γ₁ indicates the probability of group disseminators transforming

| References | Models | Research background | Contributions |
|------------|--------|---------------------|---------------|
| [28]       | CA–SIR | Negative motional contagion in a crowd | Captured the process of dynamic propagation of emotion; implication for large-scale crowd management |
| [29]       | SISa   | Affective contagion in the financial market | Considered the state of optimistic and pessimistic emotional infection in a group |
| [30]       | SOSa–SPSa | Public health emergencies | Implication for managers to control the public opinion dissemination by adjusting the proportion of initial negative emotions |
| [31]       | An emotional multiagent state switching model | Emotional contagion of netizens in rumors spreading | Explored the conversion process from individual emotions to group emotions; proposed insight into controlling trend of public opinion |
| [32]       | CA–SIRS | Emotion propagation in public emergency scenarios | Divided different individuals’ characteristics to identify the negative emotion propagation process of unexpected public events |
| [33]       | SIRS   | Panic spreading in group | Dynamically described the spreading process of group emotional contagion |
| [34]       | A two-factor information propagation model | Emotion-based social networks | Emphasized the important role of crowd emotion in information propagation |

**Table 1: Summary of existing emotional infection models.**

![Figure 1: Process of the SEI₁I₂R model state transfer.](image-url)
into the immune state with the passage of time and the attention of the event gradually decreases. The above parameters all take values in the range of 0-1.

\[ S(t), E(t), I_1(t), I_2(t), \text{and } R(t) \] respectively, stand for the proportion of emotional susceptible, latent, individual disseminator, group disseminator, and immune state to the total number of people in the network. Thus,

\[ S(t) + E(t) + I_1(t) + I_2(t) + R(t) = 1. \] (1)

Suppose the total number of Internet user groups in the network is \( N \). In the early stage of information dissemination, only one negative emotion disseminator exists. The rest of the individuals are emotionally susceptible and all other states are zero. Therefore, the proportion of each type of Internet user state at the early stage of information dissemination can be expressed as follows:

\[ S(0) = \frac{(N-1)}{N} \approx 1, \]
\[ I_1(0) = \frac{1}{N} \approx 0, \]
\[ E(0) = I_2(0) = R(0) = 0. \] (2)

Based on the above negative emotion propagation law, the following differential equations are constructed.

\[ \frac{dS(t)}{dt} = -S(t)I_1(t), \]
\[ \frac{dE(t)}{dt} = \lambda S(t)I_1(t) - (\alpha_1 \theta + \alpha_2)E(t), \]
\[ \frac{dI_1(t)}{dt} = \beta_1 I_1(t) - \gamma_1 I_1(t), \]
\[ \frac{dR(t)}{dt} = \gamma_1 I_1(t) + \beta_2 I_1(t) + \alpha_2 E(t). \] (3)

According to the results related to the SIR model, fundamental regeneration number \( R_0 \) exists during disease transmission process [35]. When \( R_0 < 1 \), the spread of a disease dissipates naturally over time; when \( R_0 > 1 \), the disease spreads widely in the population. In this study, we calculate \( R_0 \) by the set of differential equations corresponding to the SEI_1I_2R model and change the set of equations to the following:

\[ \frac{dE(t)}{dt} = \lambda S(t)I_1(t) - (\alpha_1 \theta + \alpha_2)E(t), \]
\[ \frac{dI_1(t)}{dt} = (1 - \lambda)S(t)I_1(t) + \alpha_1 \theta E(t) - (\beta_1 + \beta_2)I_1(t), \]
\[ \frac{dI_2(t)}{dt} = \beta_1 I_1(t) - \gamma_1 I_2(t), \]
\[ \frac{dS(t)}{dt} = -S(t)I_1(t), \]
\[ \frac{dR(t)}{dt} = \gamma_1 I_2(t) + \beta_2 I_1(t) + \alpha_2 E(t). \] (4)

Using the formula for solving the inverse matrix, the following is obtained:

\[ y^{-1} = \begin{bmatrix} \frac{1}{\alpha_1 \theta + \alpha_2} & 0 & 0 \\ \frac{\alpha_1 \theta}{(\alpha_1 \theta + \alpha_2)\beta_1} & \frac{1}{\beta_1 + \beta_2} & 0 \\ \frac{\alpha_1 \theta \beta_1}{(\alpha_1 \theta + \alpha_2)\beta_1 \beta_2} & \frac{1}{\beta_1 + \beta_2} & \frac{1}{\gamma_1} \end{bmatrix} \] (5)

Thus,

\[ \frac{dS(t)}{dt} \begin{bmatrix} S_0 \\ 0 \\ 0 \end{bmatrix} = \begin{bmatrix} 0 & 0 & 0 \\ \frac{\alpha_1 \theta}{(\alpha_1 \theta + \alpha_2)\beta_1} & \frac{1}{\beta_1 + \beta_2} & 0 \\ \frac{\alpha_1 \theta \beta_1}{(\alpha_1 \theta + \alpha_2)\beta_1 \beta_2} & \frac{1}{\beta_1 + \beta_2} & \frac{1}{\gamma_1} \end{bmatrix} \begin{bmatrix} S_0 \\ 0 \\ 0 \end{bmatrix} \]

\[ \approx \begin{bmatrix} 0 \\ 0 \\ 0 \end{bmatrix}. \] (6)

Therefore,

\[ R_0 = \rho(Fy^{-1}) = \frac{S_0}{\beta_1 + \beta_2}. \] (7)

In the early stage of information dissemination, \( S_0 \approx 1 \). Thus,

\[ R_0 = \rho(Fy^{-1}) = \frac{1}{\beta_1 + \beta_2}. \] (8)

One of the propagation-free equilibrium points is \( x_0 = (0, 0, 0, S_0, 0) \). If \( R_0 < 1 \), then within the emotional infection period, the negative emotions of Internet users do not spread widely, and the negative events gradually fade out of their lives; if \( R_0 > 1 \), then negative emotions may spread widely in the Internet community.
4. Numerical Simulation and Analysis

To verify model validity, the numerical simulations of the above established SEI$_1$I$_2$R model are carried out using MATLAB2017a. Assume that the density of Internet users at the initial stage of information dissemination is $S(0) = 0.999$, $I_1(0) = 0.001$, and $E(0) = I_2(0) = R(0) = 0$. With the rapid development of mobile devices and information technologies, public opinion events spread in the network immediately after they occur, and negative corporate events often involve the personal safety or personal interests of consumers. Such events immediately trigger the attention of numerous netizens once they break out. When the nature of negative events deviates from the corporate image in their own memory, netizens are easily influenced by the negative emotions of other individuals, and they often lose their rational judgment to choose to believe or dig deep into the truth of events. That is, the trust factor is at a high level. Thus, initially set the value to 0.8 and set each parameter as $\lambda = 0.2, \alpha_1 = 0.15, \alpha_2 = 0.08, \beta_1 = 0.15, \beta_2 = 0.025$ and $\gamma_1 = 0.2$.

Meanwhile, the influence of each parameter on the dissemination of negative sentiment information under negative corporate events is explored by varying parameter values.

As illustrated in Figure 2, the proportions of various types of Internet users have changed differently over time. The proportion of emotionally susceptible people decreases monotonically with time, and the decrease rate changes from fast to slow, tending to 0 in $t = 10$–$20$, indicating that all emotional susceptible people have been transformed into other status groups at this time; the proportion of latent people shows a trend of increasing and then decreasing with time, peaking at about $t = 10$, with a peak of about 0.1, and then decreasing continuously, tending to 0 in $t = 20$–$40$; the proportion of individual transmitters also increases and then decreases, peaking at approximately $t = 15$, with a peak of approximately 0.7, and then continues to decline, tending to 0 at $t = 120$–$140$; the proportion of group transmitters peaks at about $t = 20$, with a peak of about 0.04 and eventually tends to 0 at $t = 60$–$80$; the proportion of the immune state increases monotonically with time, with the increase rate becoming increasingly fast and slow and eventually converging to 1, which suggests that only immune individuals exist in the network at this time.

The above change in proportion is due to the fact that at the early stage of the outbreak of negative corporate events, the events fermented rapidly in the online platform, and Internet users began to express their views on the events. Negative emotions spread rapidly, and the number of emotionally susceptible people gradually decreased. The proportion of lurkers increased sharply, and some of them had certain rational thinking ability and became immune through emotional self-regulation. Others chose to believe and want to dig deep into the truth of incidents to become individual emotional communicators. At this time, enterprises realized the coming public opinion crisis and started to adopt coping strategies. Some individual disseminators were transformed into the immune state after enterprise intervention; with the continuous fermentation of negative emotions, the proportion of individual disseminators reached a certain scale. On the basis of group identification, the negative emotions of enterprises accumulate and gradually formed group-scale emotional awareness. Some individual disseminators were transformed into group emotional communicators. As time passed, the attention to the events decreased, the negative emotions of the network group gradually dissipated, and the group emotion spreaders slowly transformed into immune ones. Finally, the state of all immunity was reached in the network.

4.1. Analysis of the Influence of Trust Conversion Rate $\alpha, \theta$ on the Spread of Negative Emotions. $\alpha, \theta$ represents the probability that a latent person transforms into an individual transmitter after being influenced by negative emotions. To investigate the effect of trust conversion rate on the process of spreading negative emotions, change the values of $\alpha, \theta$, namely 0.12, 0.36, and 0.6 while keeping other parameters unchanged. The change curves of the proportion of latent and individual disseminators are displayed in Figure 3.

Figure 3 illustrates that the larger the value of the trust conversion rate $\alpha, \theta$, the lower the proportion of latent communicators, the smaller the peak, and the slower the incremental rate; the higher the proportion of individual transmitters, the larger the peak, and the faster the incremental rate. Based on the above simulation results, trust conversion rate has a great influence on latent and individual communicators. In the self-media communication era, information interaction is faster and more convenient than before, and a large amount of information is flooded in online platforms, among which no lack of false information is observed. A recent study has identified false information...
classification using supervised machine learning [37]. The scholars emphasized that fake news are rapidly spread in social media and bring negative effects to society. For negative corporate events, public opinion information is also easily fermented in the network. Given that corporate behaviors often involve the personal interests of consumers, emotions of netizens can be easily influenced by various public opinion information. Thus, lurkers who are in the wait-and-see state often choose to believe the negative corporate information that is widely spread. These lurkers also likely become the carriers of negative information dissemination.

4.2. Analysis of the Effect of Emotion Self-Regulation Rate $\alpha_2$ on the Dissemination of Negative Emotions. $\alpha_2$ represents the probability of a latent person turning into an immune individual through emotional self-regulation. Other parameters are kept unchanged, whereas $\alpha_2$ values are set to 0.08, 0.4, and 0.9. The change curves of the proportion of individual disseminators and immunizers are shown in Figure 4.

As illustrated in Figure 4, the larger the $\alpha_2$ value, the more chance the peak of the proportion of individual transmitters to be slightly reduced and the incremental rate to be slow, whereas the proportion of immunizers shows an incremental trend. However, the magnitude of change in
both is small. The effect of latent person emotional self-regulation on the proportional density of transmitters and immunizers is small, and the effect is insignificant. Prior studies revealed that an individual holds a degree of emotion self-regulation ability which can inhibit the spread of negative emotions in groups, but the inhibitory effect is limited [38]. That is, effectively controlling the outbreak of public opinion only depending on the emotional self-regulation ability of an individual is not beneficial. Similarly, in this study, during the process of negative information dissemination, lurkers pay attention to the development of events. Although they have a certain self-regulation ability, they are in the network environment of emotional fermentation and are easily influenced by the negative emotions of other individuals. Therefore, the immune state is achieved through lurkers’ own emotional regulation, and the effect fetched is minimal.

4.3. Analysis of the Effect of Individual Communication Conversion Rate $\beta_1$ on the Spread of Negative Emotions. The individual propagation conversion rate $\beta_1$ represents the probability of individual propagators’ emotion accumulation reaching a certain intensity to transform into group propagators. Other parameters are kept constant. $\beta_1$ values are changed and set to 0.015, 0.035, and 0.055. The evolutionary trend is illustrated in Figure 5.

Figure 5 shows that the larger the $\beta_1$ value, the more the proportion of individual transmitters gradually decreases, the peak becomes smaller, the increments become slower, and the time to reach the stable value is shorter. Meanwhile, the proportion of group transmitters increases, the peak becomes larger, and the incremental speed becomes faster. From the simulation results, the conversion rate of individual transmission has a great influence on the proportion of individual and group transmitters. Previous studies revealed that the more the initial negative emotions, the more the pessimistic emotions in groups [30]. Evoking a crisis of public opinion is easy when an outbreak of group negative emotions occurs. Similarly, in the current study, individual communicators, as the starting point of emotional communication, accumulate to a certain emotional intensity to turn into group disseminators on the basis of group identification. In this state, disseminators have more consistent emotions and behaviors, thus forming negative states of online group emotions, and public opinion crisis likely breaks out. To control the development of public opinion and dilute the density of group communicators, taking timely and effective measures is necessary. These measures provide targeted guidance to individual disseminators at the stage of individual communication for reducing the proportion of individual disseminators and striving to control the large-scale outbreak of negative emotions at the communication source.

4.4. Analysis of the Effect of Corporate Response Rate $\beta_2$ on the Spread of Negative Emotions. $\beta_2$ represents the probability that an individual transmitter turns into an immune state under the response and guidance of a firm to a negative event. Other parameters are kept constant. The $\beta_2$ values are changed and set to 0.025, 0.055, and 0.1. The change curves of the proportion of individuals and immunizers are displayed in Figure 6.

As shown in Figure 6, the larger the $\beta_2$ value, the more the proportion of individual transmitters decreases, the peak becomes smaller, the speed of reaching the peak becomes slower and tends to 0 in a shorter time; the immune converges to be 0 in a faster rate, indicating that it takes less time to reach the all-immune state in the system. The results are consistent with a previous study, which claimed that the timely intervention of enterprises has a positive effect on
inhibiting the spread of negative word of mouth [39]. From the simulation results in this study, the $\beta_2$ value has an important influence on the control of negative emotion information dissemination, which can well limit the proportion of individual communicators and at the same time help them reach the immune state quickly. In the context of negative corporate events, the targeted guidance toward individual communicators has a good effect on the stability of the system. After a negative event occurs, reacting to the massive spread of the event on an online platform is often too late for a company. If the company can provide timely explanation and response to the event at the individual communication stage, then it can help communicators analyze the event comprehensively, look at the problem dialectically, reduce negative communication behavior, and effectively avoid the deterioration of the negative event.

5. Conclusion

This study focuses on the research context of negative event communication in enterprises, divides communication stages into two: individual and group emotion communication, constructs the SEI$I_1$R model of negative emotion information communication among Internet users, simulates the model on the basis of solving the basic regeneration number, and verifies model validity with real cases. The following conclusions are drawn.

(1) The trust and communication conversion rates are proportional to the negative emotion transmission rate of Internet users, i.e., the higher the trust and communication conversion rates, the higher the negative emotion transmission rate of Internet users. Therefore, enterprises can reduce the ratio of individual and group communicators by lowering the information trust factor and dissemination conversion rate when taking response measures to shrink the scale of negative information spreading and avoid the generation public opinion crisis.

(2) The enterprise response rate is inversely proportional to the rate of spreading negative emotions among Internet users, i.e., the higher the response rate of enterprises, the more effectively they can control the rate of spreading negative emotions among Internet users. During the process of information dissemination, enterprise attitudes of not evading and actively responding can enable Internet users to directly contact the truth of an incident, guide them to rational analysis, and reduce the behavior of spreading negative emotions.

(3) The effect of self-regulation of Internet user emotions is insignificant. Although individuals have a certain ability to self-regulate their emotions, they are easily influenced by others’ emotions in an emotionally fermenting network environment. The effect of self-regulation on the control of public opinion is negligible. Therefore, after the occurrence of negative events, enterprises must respond immediately and channel the negative emotions of netizens to effectively control the development of enterprise public opinion.

6. Practical Implications

This research has several practical implications. For internet users, individuals should increase their information identifying capability in the social network. Rather than rapidly releasing unpleasant feelings on the media platform, which adds to the difficulty of controlling network public opinion, netizens should conduct thoroughly examine firms’ previous performance in response to negative events. For enterprises,
they can take appropriate measures to deal with the crisis of corporate public opinion. In the era of social media, network users can exchange information more quickly and easily, and firms are likely to be swiftly exposed on the online media platform after encountering negative incidents. The negative information can also be spread rapidly by internet users. Therefore, it is vital to recognize and comprehend the emotional trends of netizens on time, and enterprises must be able to provide targeted counseling at the earliest stage of the emergence of negative feelings in individuals. In addition, enterprises should explain the reasons for the occurrence of negative events and take appropriate action for the first time, such as dissipating the negative evaluation of enterprises generated by negative events through corporate social responsibility efforts.

7. Limitations and Future Research

This study also has some limitations. First, this study does not consider government intervention’s impact on netizens’ spread of negative emotions when negative events occur in enterprises. Research on online public opinion has shown that active government intervention can effectively control the development of online public opinion [14]. Therefore, future research can add government intervention behavior factors or take effective linkage measures through government-enterprise cooperation to explore its impact on enterprise network public opinion control. Second, regarding the specific corresponding measures of enterprises, this paper does not distinguish between specific behaviors. Moreover, the different behavioral measures taken by enterprises in response to negative events may have different degrees of impact on the emotional dissemination of netizens. Therefore, future research can refine the specific behavioral measures of enterprise response and consider the effect of different behavioral measures on the evolution of corporate public opinion. Third, several studies adopt state-of-the-art, such as machine learning, to explore the topic of information propagation in social media [37]. Thus, future works can replicate our research using a machine learning approach. It is interesting to compare the results obtained from different methods.

Data Availability

The data used to support the findings of this study are available from the corresponding author upon request.

Conflicts of Interest

The authors declare no conflicts of interest.

Authors’ Contributions

CL and RS: conceptualization and formal analysis. CL and XH: methodology. XH and RS: model building. RS and CL: validation. CL: writing original draft preparation. RS: supervision, and writing review and editing. All authors contributed to the article and approved the submitted version.

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