Negative tourism rumors towards user online citizenship behavior: the differential influence of correction sources

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Abstract
Purpose — Negative rumors damage the destination’s image and tourist experience. This study aims to compare how rumor correction sources (government vs business vs tourist) affect user online citizenship behavior (UOCB).

Design/methodology/approach — Based on the stimuli-organism-response framework, a hypothetical model was established from rumor correction to UOCB. Three scenario experiments (more than 1,000 valid samples) were designed. Study 1 illustrated the effects of different rumor corrections. Study 2 was designed to verify the mediating effects of sympathy and perceived information authenticity (PIA) and the robustness of results was demonstrated in Study 3.

Findings — Government correction elicited the highest sympathy and PIA. Business correction was less than tourist correction in arousing sympathy but better than tourist correction in enhancing PIA. Sympathy and PIA had a mediating effect on the relationship between rumor correction and UOCB.

Practical implications — This study helps to identify the different advantages of rumor correctors and provides insights to prevent the deterioration of negative tourism rumors or even reverse these crises.

Originality/value — This study innovates research perspective of negative tourism rumor governance, expands the understanding of the effect and process of rumor correction and enriches the research content of tourism crisis communication.

Keywords Negative tourism rumors, Rumor correction sources, Online citizenship behavior, Perceived information authenticity, Sympathy

Paper type Research paper
Rumores turísticos negativos con relación al comportamiento cívico online de los usuarios: la influencia diferencial de las fuentes de corrección

Resumen

Propósito: Los rumores negativos dañan la imagen del destino y la experiencia del turista. Este estudio compara cómo afectan las fuentes de corrección de rumores (gobierno vs empresas vs turista) en el comportamiento cívico online de los usuarios (CCOU).

Disenio/metodología/enfoque: Sobre la base del marco estimulo-organismo-respuesta, se estableció un modelo hipotético desde la corrección de rumores hasta el CCOU. Se diseñaron tres escenarios experimentales (más de 1,000 muestras válidas). El Estudio 1 ilustró los efectos de las diferentes correcciones de rumores, el Estudio 2 se diseñó para verificar los efectos mediadores de la simpatía y la autenticidad percibida de la información (API), y la solidez de los resultados se demostró en el Estudio 3.

Hallazgos: La corrección del gobierno obtuvo la mayor simpatía y API. La corrección de la empresa despertó menos simpatía que la corrección del turista, pero fue mejor para generar API. La simpatía y la API tuvieron un efecto mediador en la relación entre la corrección del rumor y el CCOU.

Implicaciones practices: Ayuda a identificar las diferentes ventajas de los correctores de rumores y proporciona información para prevenir el deterioro de los rumores turísticos negativos o incluso revertir estas crisis.

Originalidad/valor: Proporciona una nueva perspectiva de investigación de la gobernanza del rumor turístico negativo, amplía la comprensión del efecto y el proceso de corrección de rumores y enriquece el contenido de la investigación de la comunicación de crisis turísticas.

Palabras clave Rumores turísticos negativos, Fuentes de corrección de rumores, Comportamiento cívico online, Autenticidad percibida de la información, Simpatía

Tipo de papel Trabajo de investigación

1. Introduction

Negative rumors are unverified information released by rumormongers to intentionally smear victims and attract public attention (Kamins et al., 1997; Choi and Seo, 2021). Massive amounts of information are produced, disseminated and consumed every day (Fedeli, 2020), creating space for negative tourism rumors to spread quickly and widely (Vosoughi et al., 2018). They may be browsed, followed or shared by users in different places within a short time and deteriorate into a real-time crisis, resulting in more negative comments and destination avoidance (Pal et al., 2020; Bethune et al., 2022; Wang et al., 2023). For example, nuclear leakage rumors caused by the Fukushima earthquake in Japan led to a sharp decline in inbound tourists’ travel intentions (Jin et al., 2019). Although negative rumors threaten destination image and management (Mohamed et al., 2018; Fedeli, 2020), existing literature has difficulty providing targeted guidance to cope with rumor crises. This paper discusses the governance direction for negative tourism rumors.

There are phenomena online in which “users voluntarily correct wrong comments and maintain a harmonious communication environment”, namely, user online citizenship behavior (UOCB) (Son et al., 2016). In negative tourism rumor situations, UOCB is not limited to specific users’ support for destinations but leads others to join the counterattack against negative rumors (Yi et al., 2013; Son et al., 2016; Choi and Seo, 2021). This crowdsourcing delivery creates immeasurable positive spillover effects (Buhalis and Sinarta, 2019; Pal et al., 2019). This study speculates that UOCB provides practical direction and theoretical clues for negative tourism rumor governance. As a common form of communication that effectively prevents the deterioration of negative rumors, rumor correction alleviates users’ perceptual uncertainty and induces them to make correct judgments (Pal et al., 2020; Choi and Seo, 2021). These are the keys for users to protect victims and conduct UOCB (Gong and Yi, 2021). Rumor correction may become the breakthrough point to foster UOCB.

Scholars explore the effects of different types of rumor correction content (e.g. denial, refutation and attacking the attacker) or channels (e.g. social media and traditional media) (Paek and Hove, 2019; Guo et al., 2023). “Who corrects” is also one of the keys to successful correction (Dedeoglu, 2018; Sano and Sano, 2019). Zhang et al. (2020) believe that the government correction makes the public think rationally and guides them to refute...
rumors. Emotional power cannot be ignored in crisis situations (Xie et al., 2022). Individual rumor correction arouses the opinions and emotional resonance of others (Anagnostopoulou et al., 2019; Majid et al., 2021). Corrective statements issued by the victimized business of negative rumors arouse positive responses. In response to negative tourism rumors, rumor correction from the government, businesses and tourists all contribute to a certain degree. The difference in effect of different correctors is unclear. This paper clarifies the differentiated role of rumor correction sources (government, business and tourist) on UOCB.

This study aims to answer the following questions:

Q1. Are there different effects of rumor correction among the government, business and tourist?

Q2. What is the mediating mechanism between rumor correction sources and UOCB?

This study constructs a research framework based on the stimulus-organism-response (SOR) framework and designs three situational experiments to verify the relationships between rumor correction sources (government vs business vs tourist) and UOCB. It explores the mediating effects of sympathy and perceived information authenticity (PIA). Theoretically, this paper clarifies the persuasive effects of different correctors and the formation mechanism of UOCB, which provides an innovative research perspective on negative tourism rumor governance. It expands the content framework of tourism crisis communication research and deepens the application of the SOR framework in tourism crisis research. In practice, it identifies the correction effects and advantages of different correctors and provides effective strategies for negative tourism rumor management.

2. Literature review and research hypotheses

2.1 Research on tourism crisis communication

Tourism crisis communication refers to the collection, processing and dissemination of any necessary information in times of crisis (Sano and Sano, 2019), and reduces unnecessary fears and uncertainty of tourists and gains their trust and forgiveness (Berbekova et al., 2021). Although its theoretical framework has been expanded (Coombs, 2007; Pascual-Fraile et al., 2022), it still rarely involves the response and management of negative rumors. With the widespread use of social media, information is generated and disseminated significantly faster than in the early period (Wang et al., 2023). Negative tourism rumor, a special victim crisis, quickly generates real-time information (e.g. hashtags, keywords, opinions and emotions shared by users) (Buhalis and Sinarta, 2019), resulting in a crisis of online public opinion (Wang et al., 2023). They interfere with tourists’ judgment, and damage destination image and its stable development (Fedeli, 2020). Rumor correction, the critical carrier for crisis communication on negative tourism rumors, is the deliberate attempt to limit or prevent the spread of rumors (Song et al., 2021). It is difficult for users to distinguish rumors from truths, and their judgements largely depend on correction (Majid et al., 2021). Different corrective content (denial vs refutation) and correction platform (social media vs traditional media) rationally persuade or emotionally move the message recipient to different degrees (Andrews et al., 2016; Pal et al., 2019; Guo et al., 2023). Importantly, correctors greatly influence the results of negative rumor communication. Especially when negative tourism rumors spread online, various correctors (e.g. government, business and tourists) usually appear on social platforms (Xie et al., 2022; Johnson and Buhalis, 2022). Whether there is a differential persuasion effect of government vs business vs tourist correction is less explored. This paper compares different correction sources (government vs business vs tourist), providing a new perspective for dealing with and managing negative tourism rumors.

2.2 Research on user online citizenship behavior

Customer citizenship behavior is customers’ voluntary and discretionary extra-role behavior, which provides extraordinary value for organizational development (Groth, 2005).
Studies measure customer citizenship behavior, identify its concept boundary and explore its positive antecedents (e.g. customers' characteristics) and consequences (e.g. triggering harmonious social relationships) (Assiouras et al., 2019; Gong and Yi, 2021). Few articles discuss UOCB (Son et al., 2016), not to mention its purifying function and important role in crisis situations.

The topic of negative tourism rumors is mixed with rumors, derivative rumors and truth (Vosoughi et al., 2018). Once the corrective information is posted, users detect and eliminate false or ambiguous information. They even voluntarily like, publish or forward corrective remarks, acting as online correctors of negative comments, that is, UOCB (Son et al., 2016; Pal et al., 2019). UOCB can trigger a virtuous cycle during the interaction of users: crowdsourcing corrective information and crowdsourcing corrective behavior (Pal et al., 2019; Buhais and Sinarta, 2019). The power of UOCB and crowdsourcing correction is enormous, reducing the likelihood of more users being misled and cheaply guiding them to become victim's supporters. UOCB apparently accelerates the disclosure of truth and solves the rumor crisis. There are still limitations for discussion on UOCB's induction in the context of negative tourism rumors. This paper discusses UOCB's formation mechanism under the influence of rumor correction.

2.3 The stimulus-organism-response framework

The SOR framework was proposed by environmental psychologists Mehrabian and Russell (1974) and is regarded as an information-processing model due to its strong flexibility (Hew et al., 2018). “S” refers to the signal from the external environment; “O” represents the user’s emotional or cognitive response after evaluating the stimulus; and “R” is their behavioral response (Mehrabian and Russell, 1974).

The responsibility attribution for negative rumors belonging to a victim crisis is small or even nonexistent (Coombs, 2007). Tourism rumor correction, which can be viewed as “S”, debunks false information and presents facts, signaling to users that “the destination is in a disadvantaged position and the real victim”. When a destination is damaged by crises without responsibility, it will receive sympathy from tourists (Su et al., 2023). Sympathy may be the users’ emotional response (O) after reading rumor correction. Negative rumors are often filled with prejudice and exaggerated expressions to denigrate and attack destinations (Mohamed et al., 2018). Rumor correction vigorously opposes the original rumor wording, which stimulates users’ cognitive thinking. When faced with rumor correction, users evaluate its authenticity to satisfy their curiosity and eliminate uncertainty (Guo et al., 2023). PIA may be their cognitive response (O). Many users give free help to victims of false rumors and cyber violence and engage in a series of UOCB to oppose attackers (Son et al., 2016; Gong and Yi, 2021). Sympathy or PIA indicates that users are probably certain that the destination is being attacked. UOCB may be the positive behavioral response (R).

The SOR framework is applied to compare individual perceptual and behavioral differences caused by different stimuli (Hew et al., 2018). There are differences in information persuasiveness and emotional rendering intensity of tourism rumor correction from different sources. Based on this, a research model is constructed in Figure 1 to explore the influence mechanism of negative tourism rumor correction on UOCB. It suggests that different rumor correction sources are the “S”. Sympathy and PIA are the “O”. UOCB is the “R”.

2.4 Mediating role of sympathy

Sympathy, typical altruism, refers to the emotional state in which individuals care about disadvantaged objects (Antonetti and Maklan, 2018). It often happens in the context of victim crisis (Su et al., 2023). Negative tourism rumor correction conveys the fact that the destination is attacked and stigmatized, which may arouse sympathy. Given different correctors have different images and communication styles, the degree of sympathy
generated by their correction may be different. Users intend to strengthen their ties with reference groups (Yi et al., 2013). Users and tourists have the most similar identities and close psychological distance. Compared with highly standardized and formal correction by the government and business, tourist correction is more informal communication based on tourists’ wishes (Anagnostopoulou et al., 2019; Zhang et al., 2023). After being stimulated by tourist correction, they interact with tourists emotionally and are as attentive and sympathetic to destinations like tourists. The government debunks rumors as an indirect victim, and its online influence and guiding power are stronger than those of businesses (Andrews et al., 2016). Government correction may arouse more sympathy than business correction. Therefore, the hypothesis is as follows:

H1. Tourist correction evokes higher sympathy than (a) government correction and (b) business correction and government correction evokes higher sympathy than (c) business correction.

A positive association between sympathy and prosocial and citizenship behavior has been demonstrated (Nicely and Armadita, 2018). Su et al. (2023) show that individuals who sympathize with victims pay more attention to victims’ inferior status and engage in a series of supportive behaviors. Valdés-Cuervo et al. (2021) find that sympathy in cyberbullying events eventually leads to positive online behaviors. According to the SOR framework, users’ sympathy for the destination, as an emotional response, may motivate them to engage in UOCB. Therefore, the hypothesis is as follows:

H2. Sympathy mediates the relationship between rumor correction and UOCB.

2.5 Mediating role of perceived information authenticity

PIA is the evaluation result of authenticity when individuals read information (Newman, 2019; Zhang and Patrick, 2021). Due to the uncertainty of negative rumors, correction
information may have an informational impact on users and prompt them to access information authenticity, which is consistent with the cognitive process in the SOR framework. The expression, professionalism and reputation of the publisher influence the users’ judgment (Dedeoglu, 2018). Government (vs businesses/tourist) correction is the most powerful “reassurance” because the government has a stronger sense of credibility and authority when proving the innocence of the victim (Zhang et al., 2020; Wan et al., 2022). When the government has a high reputation, users are less likely to question its intention and behavior; that is, they have the highest authenticity perception of government correction. The business (vs tourist), under attack from rumors, has more urgent and determined desire to correct rumors and prove its innocence. Business also has a better say in explaining the truth and can provide useful and detailed arguments (Barbe and Pennington-Gray, 2018; Li et al., 2022). These factors weaken users’ perceived uncertainty, thus improving PIA. Tourist correction is usually based on personal experience and judgement and focuses on a direct expression of personal opinions. Business (vs tourist) correction gives users a stronger sense of authenticity. Therefore, the following hypotheses are proposed:

\[ H3. \] Government evokes higher PIA than (a) business correction and (b) tourist correction and business correction evokes higher PIA than c) tourist correction.

High PIA triggers individuals’ positive behaviors, such as purchasing behavior, information sharing and online interaction (Zhang and Patrick, 2021). Users’ authenticity perception of tourism rumor correction deepens their recognition and trust of correctors (Dedeoglu, 2018). It may drive them to support, respond to, cater to and imitate online correction behaviors. Therefore, perceived correction authenticity may produce UOCB. The following hypothesis is proposed:

\[ H4. \] PIA mediates the relationship between rumor correction and UOCB.

3. Overview of the three studies

Scenario-based experiments verify the differentiated influence of independent variables (IVs) of different situations on subjects’ judgments (Zhang et al., 2023). Three scenario experiments collected social samples and used a one-factor (correction source: government vs business vs tourist) between-subjects experimental design. To ensure maximum internal validity and external validity, Studies 1–3 had differences and similarities in negative rumor background, form of corrective information, corrective information for three correction groups, method of data collection and scope of hypothesis testing. See Table 1 for details.

4. Study 1

4.1 Pretest

4.1.1 Experimental design and procedure. A pretest was used to evaluate whether the subjects accurately distinguished rumor correction sources. Its stimulus materials consisted of two parts: negative rumor and corrective information. The theme of negative rumor was “Tourists had safety risks when sightseeing by boat at Destination A”. The design of corrective information drew upon the basis of classical rhetorical philosophy with ethos, logos and pathos (Sano and Sano, 2019). Ethos represents trustworthiness and reliability, and logos represent information richness, both of which are cognitive effects. Pathos emphasizes emotional effects. This article was concerned with subjects’ cognitive and emotional responses and designed corrective information involving these three elements. In three groups (government/business/tourist correction), except for different correctors, the corrective information, text form, 70–80 Chinese characters, etc., are the same. Appendix 1
presented that the layout of stimulus materials referred to posts on Sina Weibo (an important platform for the outbreak and correction of tourism rumors in China).

Ninety-nine participants (45.5% female) were recruited and randomly assigned to either group. Participants were organized into a classroom at researcher’s school and presented with a PowerPoint presentation containing the stimulus materials and research purpose. After viewing negative rumor and corrective information, in turn, they were asked to rate source credibility to distinguish corrector using a seven-level Likert scale in Appendix 2 (Dedeoglu, 2018).

4.1.2 Data analysis and results. The data analysis with SPSS showed that the reliability of source reliability reached the standard ($\alpha = 0.898$). One-way analysis of variance (ANOVA) showed that the sources of rumor correction in the three groups of materials were distinguished ($M_{\text{government-correction}} = 4.961$, $M_{\text{business-correction}} = 4.765$, $M_{\text{tourist-correction}} = 4.294$, $F(2, 96) = 4.139, p = 0.019$), indicating successful manipulation of IV.

4.2 Main experiment

4.2.1 Experimental design and procedure. A total of 210 participants were randomly recruited (201 valid samples; Table 2 reported detailed demographic information) and invited to another classroom. Participants were shown a PowerPoint presentation of the same material and research purpose as in the pretest. Before reading the material, participants answered four emotion items to eliminate emotional interference (Lv et al., 2021; see Appendix 2). Subsequently, they read negative rumor and corrective information. Finally, they completed a questionnaire to rate source reliability, sympathy and PIA. By combining the study scenarios, sympathy (three items) and PIA (three items) were measured with reference to Antonetti and Maklan (2018) and Zhang and Patrick (2021), respectively (seven-level scales; see Appendix 2).

4.2.2 Data analysis and results. In Table 3, the reliability and validity analysis using SPSS and AMOS software reported that all variables had Cronbach’s alphas well above 0.7, and their standard factor loadings were greater than 0.5. Confirmatory factor analysis (CFA) showed that the fit index of each variable measurement model was good (Table 4).

One-way ANOVA displayed that there was no significant difference in emotion among the different groups ($M_{\text{government-correction}} = 5.459$, $M_{\text{business-correction}} = 5.561$, $M_{\text{tourist-correction}} = 5.393$).

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Source: Authors’ own creation

Table 1 Overview of the Studies 1–3

TOURISM REVIEW
The IV was successfully manipulated because the level of source credibility was significantly different among groups (M\text{government-correction} = 5.004, M\text{business-correction} = 4.725, M\text{tourist-correction} = 4.465, F(2, 198) = 5.532, p = 0.005). ANOVAs with rumor correction as IV and sympathy as dependent variable (DV) revealed a significant

![Table 2](image)

![Table 3](image)

\[ F (2, 198) = 0.198, \ p = 0.820. \]
effect ($M_{\text{government-correction}} = 4.602$, $M_{\text{business-correction}} = 3.967$, $M_{\text{tourist-correction}} = 4.245$, $F(2, 198) = 4.416$, $p = 0.017$). ANOVAs with rumor correction as IV and PIA as DV revealed a significant effect ($M_{\text{government-correction}} = 4.950$, $M_{\text{business-correction}} = 4.624$, $M_{\text{tourist-correction}} = 4.318$, $F(2, 198) = 8.313$, $p < 0.001$). The results in Figure 2 indicated that $H_{1b}$, $H_{1c}$, $H_{3a}$, $H_{3b}$ and $H_{3c}$ were verified, whereas $H_{1a}$ was unsupported.

5. Study 2

5.1 Pretest
Stimulus materials included negative rumor and corrective information. Compared with Study 1, there was a new negative rumor: the danger of unsafe travel caused by “many tourists had gathered at Destination A”. The same design principles were applied as in Study 1 to design corrective information. The correction information of different groups was consistent in some aspects (e.g. same text form and Sina Weibo typesetting), but its content combined corrector characteristics (Appendix 1). On September 13–16, 2022, we recruited 150 samples (56.7% female) on the Credamo (a professional online questionnaire collection platform in China). They were randomly assigned to a rumor correction group and asked to rate source credibility. One-way ANOVA indicated that there were significant differences in the level of source credibility ($\alpha = 0.918$) among the three groups ($M_{\text{government-correction}} = 4.725$, $M_{\text{business-correction}} = 4.400$, $M_{\text{tourist-correction}} = 4.040$, $F(2, 147) = 4.799$, $p = 0.010$), confirming successful manipulation of IV.

![Figure 2](https://example.com/figure2.png)

**Source:** Authors’ own creation
5.2 Main experiment

5.2.1 Experimental design and procedure. On September 19–23, 2022, 200 participants were recruited on the Credamo. They were randomly assigned to either rumor correction group. First, they answered the emotion scale before the experiment. After reading the material (same as the pretest), they were asked to fill out the questionnaire about source credibility, sympathy, PIA and five items of UOCB measured from Son et al. (2016) (seven-level scales; see Appendix 2). One hundred ninety valid samples were obtained. Table 2 demonstrates detailed demographic information.

5.2.2 Data analysis and results. The Cronbach's alphas and standard factor loadings were up to standard (Table 3), and the fitting index of each variable measurement model was good (Table 4). One-way ANOVA showed that there was no significant difference in emotion among groups ($M_{\text{government-correction}} = 5.409$, $M_{\text{business-correction}} = 5.392$, $M_{\text{tourist-correction}} = 5.838$, $F(2, 187) = 2.560$, $p = 0.080$). Thus, the influence of emotion was excluded. The level of source credibility was significantly different ($M_{\text{government-correction}} = 5.016$, $M_{\text{business-correction}} = 4.563$, $M_{\text{tourist-correction}} = 4.213$, $F(2, 187) = 6.356$, $p = 0.002$), indicating a successful manipulation of the IV.

As shown in Figure 3, ANOVAs with rumor correction as IV and sympathy as DV revealed a significant effect ($M_{\text{government-correction}} = 4.735$, $M_{\text{business-correction}} = 3.682$, $M_{\text{tourist-correction}} = 4.300$, $F(2, 187) = 26.401$, $p < 0.001$). ANOVAs with rumor correction as IV and PIA as DV revealed a significant effect ($M_{\text{government-correction}} = 4.810$, $M_{\text{business-correction}} = 4.323$, $M_{\text{tourist-correction}} = 3.894$, $F(2, 187) = 12.209$, $p < 0.001$). Therefore, Study 2 confirmed the rationality of Study 1, that was, $H_{1b}$, $H_{1c}$, $H_{2a}$, $H_{3b}$ and $H_{3c}$ were supported, whereas $H_{1a}$ was not.

To investigate the process mechanism of rumor correction and UOCB, the model of Process 4 was selected, with a 95% confidence interval and 5,000 resampling bootstraps (Lv et al., 2021). The rumor correction source was IV, and UOCB was DV. Among them, different correction sources (government, business and tourist) were automatically coded as dummy variables, and the mediating variables and DV were continuous variables.
The analysis indicated a statistically significant relative indirect effect of the two rumor correction sources on UOCB through sympathy ($D_{\text{government-correction vs business-correction}}$: $a_1 = 1.054, b = 0.169, a_1b = 0.178, \text{CI} [0.010, 0.388]$; $D_{\text{tourist-correction vs business-correction}}$: $a_2 = 0.618, b = 0.169, a_2b = 0.104, \text{CI} [0.006, 0.228]$). There was a statistically significant relative indirect effect of the two rumor correction sources on UOCB through PIA ($D_{\text{government-correction vs business-correction}}$: $a_3 = 0.486, b = 0.165, a_3b = 0.080, \text{CI} [0.010, 0.179]$; $D_{\text{tourist correction vs business-correction}}$: $a_4 = -0.429, b = 0.165, a_4b = -0.071, \text{CI} [-0.181, -0.005]$). Therefore, $H2$ and $H4$ were supported.

6. Study 3

6.1 Experimental design and procedure

To enhance results’ robustness, rumor background remained unchanged from Study 2: there was a phenomenon of tourist crowding at Destination A. Corrective information included not only text but also pictures. Three pictures captured the scene of the large number of tourists gathered at Destination A. On this basis, the obvious red font – “false” – was marked. Three pictures showed the real number of tourists, and the obvious red font – “true” – was marked. Other details were the same as those controlled in Study 2 (Appendix 1). On September 24–30, 2022, a total of 430 participants were recruited on the Credamo and randomly assigned to one of the three groups. After answering the emotion items, they read stimulus materials and completed the items of source credibility, sympathy, PIA and UOCB. Four hundred four valid data points were obtained. Table 2 shows detailed demographic information.

6.2 Data analysis and results

The Cronbach’s alphas, standard factor loadings (Table 3) and the fitting index of each variable measurement model were up to standard (Table 4). There was no significant difference in emotion among groups ($M_{\text{government-correction}} = 5.067, M_{\text{business-correction}} = 5.237, M_{\text{tourist-correction}} = 5.210, F (2, 401) = 0.944, p = 0.390$), which excluded the potential influence of emotions. There was a significant difference in source credibility ($M_{\text{government-correction}} = 4.802, M_{\text{business-correction}} = 4.587, M_{\text{tourist-correction}} = 4.272, F (2, 401) = 9.228, p < 0.001$), suggesting successful manipulation of IV.

ANOVA with rumor correction as IV and sympathy as DV revealed a significant effect ($M_{\text{government-correction}} = 4.948, M_{\text{business-correction}} = 4.569, M_{\text{tourist-correction}} = 4.878, F (2, 401) = 10.988, p < 0.001$). ANOVAs with rumor correction as IV and PIA as DV revealed a significant effect ($M_{\text{government-correction}} = 5.099, M_{\text{business-correction}} = 4.790, M_{\text{tourist-correction}} = 4.547, F (2, 401) = 20.269, p < 0.001$). $H1b, H1c, H3a, H3b$ and $H3c$ were supported, whereas $H1a$ was not.

The mediation test procedure was the same as in Study 2, with business correction as the reference level. The analysis showed a statistically significant relative indirect effect of the two rumor correction sources on UOCB through sympathy ($D_{\text{government-correction vs business-correction}}$: $a_1 = 0.560, b = 0.094, a_1b = 0.052, \text{CI} [0.004, 0.110]$; $D_{\text{tourist-correction vs business-correction}}$: $a_2 = 0.230, b = 0.094, a_2b = 0.022, \text{CI} [0.006, 0.054]$). There was a statistically significant relative indirect effect of the two rumor correction sources on UOCB through PIA ($D_{\text{government-correction vs business-correction}}$: $a_3 = 0.327, b = 0.115, a_3b = 0.038, \text{CI} [0.011, 0.074]$; $D_{\text{tourist-correction vs business-correction}}$: $a_4 = -0.241, b = 0.115, a_4b = -0.028, \text{CI} [-0.059, -0.005]$). $H2$ and $H4$ were supported.

7. Conclusion and discussion

7.1 Findings

First, rumor correction by government, business and tourist triggers users’ positive emotion (sympathy) and cognition (PIA). Among these, the government correction has the greatest advantage, and the business and tourist corrections have obviously different influences.
Government (compared to tourist and business) correction inspires the highest level of sympathy, which verifies government information’s emotion-inducing ability in the governance of negative tourism rumors. Turning online “bystanders” into “apologists” requires prompting them to believe victims (Son et al., 2016). The authority and professionalism of governments (especially with high reputation) better highlights tourism rumors’ harmfulness and vindicates the victim, which encourages users to sympathize with destination.

Tourism crisis management needs the active response of different stakeholders, and the government acting as a leader in conveying information is professional, accurate and trustworthy (Johnson and Buhalis, 2022; Wan et al., 2022). This study confirms that rumor correction by the government stimulates high levels of PIA, which is consistent with previous conclusions. In conclusion, government correction has a prominent induction effect on users’ emotional and cognitive responses, reminding that destination governments play a key role in tourism rumor management.

User-generated content easily arouses the emotional resonance of information receivers (Anagnostopoulou et al., 2019). Some tourists may also become “network opinion leaders” in crisis topics and affect others’ emotions and behaviors (Xie et al., 2022). This paper finds that tourist correction persuades users at the emotional level (sympathy) better than business correction, which extends above conclusions in the context of negative tourism rumors. The function of the online management response of tourism and hotel businesses is to provide true information and reduce users’ uncertainty (Gong et al., 2022). This paper finds that business (vs tourist) correction has more advantage of improving PIA, which emphasizes the need for organizational response to negative rumors and its functional orientation. The communication roles and advantages of business and tourist are obviously different. It echoes existing research results and indicates that when dealing with negative tourism rumors, businesses should update true information (Li et al., 2022; Gong et al., 2022) and induce tourists to publish emotional correction.

Second, UOCB is the response of positive emotion and cognition. The heat and spreading speed of rumors sometimes exceed the truth, which enhances the difficulty of users’ judgement (Vosoughi et al., 2018). Once users perceive correction authenticity, they trust corrective content and support corrective behavior, thus showing UOCB such as making positive statements and refuting rumors. This conclusion deepens the understanding of the process of UOCB induction in the context of tourism rumor correction. Sympathy has repeatedly been proven to be a predictor of positive behavior (Su et al., 2023). This study echoes this view in the field of tourism rumor correction. Specifically, sympathy makes users more aware of the victim’s innocence and misfortune (Antonetti and Maklan, 2018) and enables users to criticize and discourage negative online comments, leading to various positive online actions.

7.2 Theoretical contributions

First, the comparison of the persuasive effect of different correctors in response to negative tourism rumors innovates the perspective of tourism rumor governance and strengthens the cognition of the subfield of tourism crisis communication. Although scholars attach great importance to tourism crisis communication (Pascual-Fraile et al., 2022), they rarely discuss negative tourism rumor correction, a special field of crisis communication. Negative tourism rumors are extremely easy to produce on social media and evolve into a second crisis (Anagnostopoulou et al., 2019; Xie et al., 2022). This paper clarifies the different communication effects of rumor correction of government/business/tourist. It confirms the governance logic of negative tourism rumors from a new perspective of different correction publishers, fills the research gaps on communication strategies of negative tourism rumors and expands the theoretical framework of tourism crisis communication.
Second, this paper suggests that different rumor correction triggers different levels of sympathy and PIA, which deepens the understanding of the communication effectiveness of different correctors. After tourism crisis communication, tourists’ trust in communicators, perception of destination image and safety and emotional recovery process all interfere with their behavioral intention and decision-making (Berkhoveka et al., 2021; Pascual-Fraile et al., 2022). Limited studies focus on online users’ cognitive and emotional responses in the situation of negative tourism rumors. This study constructs the theoretical framework among rumor correction sources, sympathy/PIA and UOCB. Whether it is to move users emotionally (sympathy) or to persuade them rationally (PIA), government correction has the greatest advantage. Business (vs tourist) correction is at a disadvantage in arousing sympathy but wins in improving PIA. It reveals the key elements and the core corrector of successful correction and re-examines the respective strengths of business communication and tourist communication.

Third, based on UOCB, this paper innovates the research perspective of the effect of tourism rumor correction. Previous references concern whether rumor correction wins the understanding, trust and approval of information recipients or triggers them to support victims and spread corrective information, etc. (Pal et al., 2019). The evaluation of the correction effect of rumors based on the perspective of UOCB is ignored. UOCB encourages more netizens to participate in rumor correction and harmonious communication and accelerates the spread and diffusion of truth (Son et al., 2016). This cleansing effect triggers crowdsourced corrective information and crowdsourced corrective behavior (Bethune et al., 2022). As advocated by Son et al. (2016), the role of UOCB in overcoming rumors should be discussed more. This study identifies the induction process of UOCB, which adds to the theoretical discussion on the effect and strategies of tourism rumor correction and responds to scholars’ theoretical call.

### 7.3 Managerial implications

First, the government’s key role in correcting tourism rumors should be given full play. Social media technology is applied in government work (Xie et al., 2022). Destination governments should respond to the appearance of tourism rumor, grasp its evolution stage, release correction information and guide correct public opinion through social platforms and official press conferences. They can embody the authority image online through the avatar and nickname that best represent the official identity and maintain a rigorous language style and authentic expressions. They can also express the direct or indirect losses caused by rumors and emotionally call on users to focus on the fact that the destination is harmed. Second, the awareness of the business initiative to ensure the authenticity of corrective content needs to be strengthened. As the victim of rumors, business should supply the comprehensive, clear and fair truth and explanation as quickly and efficiently as possible (Gong et al., 2022; Li et al., 2022). They need to collect and afford all kinds of strong evidence (on-site pictures, audio, video, etc.) to improve users’ perception of information authenticity. Correction information should be published simultaneously on its official website and various social platforms (Guo et al., 2023). Third, to induce tourists who have or are experiencing tourism experience to participate in refuting rumors and sharing facts, managers should care about and cultivate enthusiastic online opinion leaders (Pal et al., 2019; Xie et al., 2022). Additionally, the large number of online social accounts is a potential force to curb the spread and deterioration of rumors. Managers can guide them to participate in secondary rumor correction and emotionally interact (such as with comments and forwards) with others.

### 7.4 Limitations and future research

There are three main weaknesses in this paper. First, the finding of “government rumor correction plays the most critical role” may vary from country to country. In the future, the
differentiated correction effect of the government in different cultural contexts should be compared. Second, Videos generate high presence and stories. Is there a significant difference between video and text/picture–text when designing the form of corrective content needs further investigation. Finally, our research uncovers the theoretical black box between rumor correction and UOCB without comparing the functional boundaries of various situations. Rumor coping strategies and rumor types affect individuals’ emotions and cognition, indicating that enriching the effectiveness of tourism rumor correction under different situations is a meaningful research direction.

Authorship contributions

Wen-Qi Ruan: Conceptualization, Research design, Writing, Review, Critical revision of the article, Supervision.

Fang Deng: Original idea, Writing-Original draft, Methodology, Investigation, Data Curation, Critical revision of the article.

Shu-Ning Zhang: Review and Editing, Critical revision of the article.

Yan Zhou: Investigation and Data Curation.

All authors have read and agreed to the published version of the manuscript.

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References


Appendix 1

**Stimulus materials of pretest and main experiment for Study 1:** government correction is Group 1; business correction is Group 2; and tourist correction is Group 3

The content of negative tourism rumor is the same for government correction, business correction and tourist correction:

Suppose you have enough time and budget for travel and decide to visit “Destination A” in the next few days. Therefore, you look for information about “Destination A” on Sina Weibo. Then, you get a hot search. A news media account has been spreading rumors online: “Tourists had safety risks when sightseeing by boat at Destination A in China” (Note: this picture is from sina.com). The specific content of the Sina Weibo account is shown below:

[Image of the Sina Weibo account]

However, the government/business/tourist of “Destination A” has launched a rumor correction campaign on Sina Weibo (the content of rumor correction is the same for government correction, business correction and tourist correction):

[Image of rumor correction]

**Stimulus materials of pretest and main experiment for Study 2:** government correction is Group 1; business correction is Group 2; tourist correction is Group 3

The content of negative tourism rumor is the same for government correction, business correction and tourist correction:
Suppose you have enough time and budget for travel and decide to visit “Destination A” in the next few days. Therefore, you look for information about “Destination A” on Sina Weibo. Then, you get a hot search. A news media account has been spreading rumors online about a “crowded scene” of tourists at “Destination A” in China (Note: pictures are from Sina Weibo). The specific content of the Sina Weibo account is shown below:

![A news media account](image)

However, the government/business/tourist of “Destination A” has launched a rumor correction campaign on Sina Weibo (the content of rumor correction is different for government correction, business correction and tourist correction):

- **The government**
  
  #Destination A dispels rumors

  The scene of a “crowded” at ‘Destination A’ is fake. After a site investigation and technical screening, it was determined to be a deliberate rumor that “a large number of tourists gathered at ‘Destination A’.” The dissemination of false, deceptive and misleading information is not conducive to the development of victims. All network users should take it as a warning.

- **The business**
  
  #Destination A dispels rumors

  The scene of a “crowded” at ‘Destination A’ is fake. After a site investigation and technical screening, it was determined to be a deliberate rumor that “a large number of tourists gathered at ‘Destination A’.” We call on news media to resist the release and spread of false, deceptive and misleading information, jointly create a civilized cyberspace and provide a credible travel experience for tourists.

- **The tourist**
  
  #Destination A dispels rumors

  The scene of a “crowded” at ‘Destination A’ is fake. After a site investigation and technical screening, it was determined to be a deliberate rumor that “a large number of tourists gathered at ‘Destination A’.” I just went there yesterday. There are few tourists. I don’t feel crowded. Today’s news media truly only attract attention, regardless of the true extent of the information. I truly do not like the news media that spread rumors.

**Stimulus materials of main experiment for Study 3:**

- government correction is Group 1; business correction is Group 2; tourist correction is Group 3

The content of negative tourism rumor is the same for government correction, business correction and tourist correction:

Suppose you have enough time and budget for travel and decide to visit “Destination A” in the next few days. Therefore, you look for information about “Destination A” on Sina Weibo. Then, you get a hot search. A news media account has been spreading rumors online about a “crowded scene” of tourists at “Destination A” in China (Note: pictures are from Sina Weibo). The specific content of the Sina Weibo account is shown below:
However, the government/business/tourist of “Destination A” has launched a rumor correction campaign on Sina Weibo (the content of rumor correction is different for government correction, business correction and tourist correction):
Appendix 2

Table A1 Measurement items

<table>
<thead>
<tr>
<th>Items</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Emotion</strong></td>
<td></td>
</tr>
<tr>
<td>Sad-happy</td>
<td>Lv et al. (2021)</td>
</tr>
<tr>
<td>Bad mood-good mood</td>
<td></td>
</tr>
<tr>
<td>Irritability-satisfaction</td>
<td></td>
</tr>
<tr>
<td>Depression-cheerful</td>
<td></td>
</tr>
<tr>
<td><strong>Source credibility</strong></td>
<td></td>
</tr>
<tr>
<td>The corrector is an expert about the rumor of Destination A</td>
<td>Dedeoglu (2018)</td>
</tr>
<tr>
<td>The corrector is knowledgeable about the rumor of Destination A</td>
<td></td>
</tr>
<tr>
<td>The corrector is trustworthy</td>
<td></td>
</tr>
<tr>
<td>The corrector is credible</td>
<td></td>
</tr>
<tr>
<td><strong>Sympathy</strong></td>
<td></td>
</tr>
<tr>
<td>I sympathize with Destination A</td>
<td>Antonetti and Maklan (2018)</td>
</tr>
<tr>
<td>I feel sorry for Destination A</td>
<td></td>
</tr>
<tr>
<td>I would like to support Destination A</td>
<td></td>
</tr>
<tr>
<td><strong>Perceived information authenticity</strong></td>
<td></td>
</tr>
<tr>
<td>I think the corrective information is sincere</td>
<td>Zhang and Patrick (2021)</td>
</tr>
<tr>
<td>I think the corrective information is true</td>
<td></td>
</tr>
<tr>
<td>I think the corrective information is not marketing advertising</td>
<td></td>
</tr>
<tr>
<td><strong>User online citizenship behavior</strong></td>
<td></td>
</tr>
<tr>
<td>I will maintain the image of Destination A on the internet</td>
<td>Son et al. (2016)</td>
</tr>
<tr>
<td>I will provide suggestions for Destination A to dispel rumors on the internet</td>
<td></td>
</tr>
<tr>
<td>I will participate in the activities about Destination A to dispel rumors on the internet</td>
<td></td>
</tr>
<tr>
<td>I will help Destination A dispel rumors on the internet to maintain a harmonious environment for online rumor topics</td>
<td></td>
</tr>
<tr>
<td>I will assume the responsibility of refuting rumors on the internet for Destination A</td>
<td></td>
</tr>
</tbody>
</table>

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