

An analysis of user-generated crisis frames: Online public responses to a tourism crisis

Abstract

A gap exists in the research on how online media frame a tourism crisis and the effects on travel intentions. This research proposed a basic crisis frames model for public online communications including nature (N), causes (C), processes (P), and results (R). Chinese online public opinions on the Thailand drownings in 2018 were collected and the Vector Auto-Regressive (VAR) technique explored the responses within the data. The results showed that: (1) crisis frames had a dynamic impact on negative travel intentions, and the effects and variance contributions of frames differed; (2) disturbance information produced by a negative communication incident from the destination was a factor promoting the accumulation of online public opinion; and (3) online data of public opinion and the VAR model are appropriate for research on tourism crisis information communication. This research provides new insights and a method for investigating tourism crises and dynamic responses in online communication.

Keywords: Tourism crises; online crisis communication; crisis frame; travel intentions; public opinion; VAR; Thailand

1. Introduction

The visitor economy is deeply affected by adverse safety and security occurrences (Pizam, 1996), and crisis events can seriously harm the performance of local destinations (Ajogbeje, Adeniyi, & Folarin, 2017). Recently, continuous crises, such as a series of terrorist attacks in Europe (Cró & Martins, 2017), Ebola virus in Africa (Mizrachi & Fuchs, 2016), “Occupy Central” in Hong Kong (Luo & Zhai, 2017) and the COVID-19 pandemic (Xie, Zhang, Morrison, & Coca-Stefaniak, 2021),

reduced tourism demand and devastated the visitor economy. Through the “effect of generalization”, a minor crisis in one world region can cause strong tourism demand reductions in other regions (Seabra, Dolnicar, Abrantes, & Kastenholtz, 2013), threatening the long-term development and prosperity of destinations. Destinations can reduce public threat perceptions, restore safety confidence, and maintain and promote the stability of tourism markets through media communication and the frame-setting of crisis events (Liu-Lastres, Schroeder, & Pennington-Gray, 2019; Luo & Zhai, 2017; Sano & Sano, 2019). Crisis communication serves as a critical tool in destination development and image restoration after a crisis. Particularly in the online media era, crisis communication and agenda-setting have become a crucial information source for most off-site and potential tourists to learn about crisis events as well as perceived destination safety (Kapuściński & Richards, 2016; Oliveira & Huertas-Roig, 2019). Online information plays an influential role in transforming crisis events into serious downturns in tourism (Luo & Zhai, 2017; Su, Stepchenkova, & Kirilenko, 2019). In addition, while COVID-19 restricted the public from travelling, the intra-pandemic perceptions of destinations, including on hospitality and safety, determined people’s attitudes and post-pandemic travel intentions (Li, Nguyen, and Coca-Stefaniak (2020). Therefore, tourism crisis communication and agenda-setting have become more crucial issues in restoring travel intentions after crises.

Crisis communication is derived from public relations, and tourism crisis communications focus on public perceptions of crisis events, and attempt to change public attitudes towards risks or crises, and lessen the harm of these events on destinations via message agenda-setting and communications (Coombs, 2014; Liu-Lastres et al., 2019; Sano & Sano, 2019). Tourists are easily influenced by crises within destinations and risk communications, and destination-delivered crisis and risk

messages fundamentally affect perceived safety and risk, travel fears and intentions (Wang & Lopez, 2020; Zheng, Luo, & Ritchie, 2020; Sano & Sano, 2019). In particular, people tend to seek information and participate in secondary crisis communication to protect themselves and reduce uncertainty in pre-visit stages during high-risk situations (Cahyanto, Wiblishauser, Pennington-Gray, & Schroeder, 2016). Crisis frames reflect how individuals and organizations construct and interpret crises, which enables crisis events and related messages to be located, perceived, identified, and labeled (Coombs, 2007; Knight, 1999; Liu & Pennington-Gray, 2015). Also, they change public perceptions of crises, shape public opinion and initiate public discourse (Gerken, Van der Land, & Der Meer, 2016; Cho & Gower, 2006). Therefore, crisis-framing communication can help destinations frame and agenda-set crisis events and related messages in beneficial ways and reduce the potential negative impacts (Liu & Pennington-Gray, 2015; An & Gower, 2009; Der Meer, 2014). They are a key factor determining the effectiveness of destination crisis communication. Tourist responses to destination crisis and risk frames have been the subject of empirical investigation. For example, Kapuściński and Richards (2016) examined the impact of crisis event information on perceived risk in two news crisis frames: risk amplifying and attenuating. Their results showed that risk perceived as a result of risk-amplifying frames was higher than with risk-attenuating. For COVID-19, it was confirmed that the perceived safety, basic and travel intentions responses to risk-attenuating were greater than with risk-amplifying frames (Xie et al., 2021). Therefore, destination crisis communication and responses to crisis frames have become an important topic in tourism research, fundamentally influencing the recovery and development of tourism markets after a crisis. However, the empirical investigation on tourist responses to crisis communication and frames from a public opinion evolution and development perspectives is still limited.

There are two crucial literature gaps in the related tourism research. First, there is a lack of investigation on how online media frame tourism crises. During destination crisis communication, crisis-framing serves a critical role in defining the events, identifying responsible actors, shaping public opinion, and minimizing negative impacts (Coombs, 2006; An & Gower, 2009). Tourism crisis frames and media crises portrayal have been widely investigated, mainly with a focus on how mass and new media frame and agenda-set crisis events (An & Gower, 2009; Der Meer, 2014; Liu & Pennington-Gray, 2015; Kapuściński & Richards, 2016; Ribeiro, Hartley, Nerlich, & Jaspal, 2018). With greater consumer empowerment via social media and the Internet, people contribute to defining crisis events online (Sano & Sano, 2019; Van der Meer & Verhoeven, 2013). The resulting secondary crisis communication and frames affect reactions and tourist attitudes (Van der Meer, Verhoeven, Beentjes, & Vliegthart, 2014; Luo & Zhai, 2017), as well as playing a critical role in intervening and regulating online public opinion (Su et al., 2019). However, the existing crisis frame research is primarily based upon traditional mass media, and mainly frames and portrays crises in a top-down and one-to-many approach, neglecting the consumer role in crisis framing and secondary crisis communication (Borah, 2011; An, 2011; An & Gower, 2009; Supadhiloke, 2012). The global reach, speed, and convenience of online media have gradually tipped the control in favor of consumers, which enables the framing and communication of crises in a many-to-many approach (Utz, Schultz, & Glocka, 2013; Luo & Zhai, 2017). Novel questions have arisen in this new milieu including: How does the public frame, represent and construct tourism crises in online media? Is there a basic crisis frame for public-driven online communication in tourism?

The second gap in the empirical research is on the interaction of crisis public opinion volumes and behavioral responses. The impact of crises and crisis frames on behavioral intentions has

attracted scholarly attention (Liu-Lastres et al., 2019; Kapuściński & Richards, 2016; Xie et al., 2021), and the related research has utilized a variety of methods and research designs, such as content analysis, experiments, and questionnaire surveys (An & Gower, 2009; Handler, 2016; Sano & Sano, 2019; Claeys & Cauberghe, 2014; Cheng, Mitomo, Otsuka, & Jeon, 2016) . However, the online media environment has dramatically changed the way in which people access, communicate, and frame crisis information. For example, tourists on-site at the crisis and potential visitors off-site can access the information reported by online media and participate in secondary crisis communication. This communication environment has modified the behavioral response patterns of tourists (Zhang, 2018). The resulting opinions (user-generated content), as expressions of attitudes, emotions, and behaviors of actual and potential tourists, have now become important data for analysis. Previous research based on opinions has had a focus on the division of different crisis stages and the characteristics of the evolution of opinions and their management (Luo & Zhai, 2017; Avraham & Eli, 2015; Avraham & Ketter, 2017). This avenue of research needs to be expanded and new research techniques and designs applied. In addition, travel decision-making in crisis situations is unclear. Academics widely believe that people avoid unsafe destinations, and crisis events lessen confidence and visit intentions (Sano & Sano, 2019; Zheng et al., 2020). In contrast, the known risks of certain places attracts visitors seeking adventure and a sense of excitement (Wang, Liu-Lastres, Ritchie, & Pan, 2019). Some people believe that destinations are safer after acts of terrorism (Wolff & Larsen, 2014), and purposely pursue “dark tourism” experiences in post-disaster destinations (Biran, Liu, Li, & Eichhorn, 2014). It is therefore necessary to explore how people respond to crisis events and crisis frames based on volumes of online public opinion, thus providing empirical evidence and new insights for this contested topic.

This research examined how online media frame tourism crisis events, and examined the effect of tourism crisis frames on people's negative travel intentions based on public opinion development and evolution perspectives. The specific research purposes and theoretical contributions were to: 1) based on frame theory, identify how the public framed, perceived, and constructed tourism crisis events in online media; and 2) based on public opinion volume data, investigate the dynamic impact of tourism crisis frames and travel intentions, as well as the moderating and strengthening effect of negative disturbance information, providing empirical evidence and new insights for the "travel decision debate" from an online opinion development perspective, and extending the methodologies for analyzing the dynamic responses of people to tourism crises. This research revealed the online media framing of crises and the effects on tourism, which will help guide destination crisis communication management in the online media era.

2. Literature review and hypotheses

2.1. Crisis management and crisis communication

Crises, especially avoidable ones, are a reputational threat, may reduce profitability, and affect organizational survival (Utz et al., 2013). Crisis management represents a series of corporate management behaviors that include predicting, preventing, coping with, and resolving crises, and recovering to normal, and attempting to eliminate or reduce harm (Bullock, Haddow, & Coppola, 2017). Since the occurrence of a crisis event is a systematic error rather than an isolated incident, crisis management is considered to be "a holistic process involving prevention, planning, response, recovery, and learning" (Prayag, 2018, p. 133), and the resulting management behaviors are diverse. Crisis management has the four stages of reduction, readiness, response, and recovery (PATA,

2003). Crisis communication is a crucial task in the response and recovery stages and represents the message communication and response strategies that are used through mass and online media for managing public attitudes towards crisis events, reducing the adverse effects of these events, and thereby shielding organizations, stakeholders, and the tourism sector from extensive damage (Liu-Lastres et al., 2019; Coombs, 2014). Emergency information is also distributed during crisis events (Liu-Lastres et al., 2019), such as evacuations, warnings, and reassurances, presented to the public in stages. Thus, crisis communication not only affects the development of crisis events and the effectiveness of crisis management, but also may adversely influence public perceptions, emotions and attitudes towards crises (Ball-Rokeach, 1985; Liu-Lastres et al., 2019; Sano & Sano, 2019; Cheng et al., 2016). Crisis communication is a decisive factor in avoiding the expansion of crisis damage and preventing an online public opinion crisis (Luo & Zhai, 2017; Su et al., 2019).

The rapid spread of information communication technologies has greatly changed the communication patterns on tourism crises and the public's participation in their coverage. Crisis communication has entered a new era of combining traditional with online media, and online platforms have become the primary venue for public opinion expression. Today, social media and the Internet in general are crucial in crisis communication (Cheng et al., 2016). They strongly influence not only the spread and patterns of crisis information, and the responses of crisis management teams, but also impact the public's attitudes, behaviors, and responses (Derani & Naidu, 2016). Traditional mass media, including television, radio and newspapers transmit crisis information in a one-directional format, and people are passive information receivers (Utz et al., 2013; Cheng et al., 2016). Destinations can guide the development of crisis communication and public opinion by disseminating highly consistent and strictly controlled information, thereby reducing the damage of

crisis events (Sparks, 2008). However, the development of online media has expanded public online communication, and provides new opportunities and channels for public participation in the transmission and framing of a crisis (Shah, 2005). The increases in online communication have created more discourse power for public participation in crisis communication. People can freely express opinions online, and discuss, share, and forward information about crises with others and news media channels (Sandoval & Fuchs, 2010; Utz et al., 2013; Schultz, Utz, & Göritz, 2011). They may even serve as “opinion leaders” in spreading crisis information (Luo & Zhai, 2017). People have transformed from passive agenda receivers to active participants (Lin, Spence, Sellnow, & Lachlan, 2016). Schultz et al. (2011) proposed the concept of secondary crisis communication, that is, people’s online behavior through commenting about, sharing, and forwarding posts relating to crises. Secondary crisis communication is a critical factor affecting the development of public opinion related to crisis events. Opinion accumulation and the resulting “public opinion storms” may trigger group conflicts, social contradictions, and tourism boycotts (Luo & Zhai, 2017). Online communication brings together people at a crisis site and those in virtual space (Morris & Rubin, 2013). Online social convergence represents the activities and interpretations of people in response to a crisis who express opinions on platforms such as Weibo, and Facebook (Hughes, Palen, Sutton, Liu, & Vieweg, 2008; Morris & Rubin, 2013). The resulting first-hand and up-to-date observations and information, as well as collective intelligence, significantly impact crisis responses, public opinion, and communication. The growth of online social convergence has created new interactions among different groups of people in response to crises (Morris & Rubin, 2013). Thus, it is crucial to understand the crisis framing of secondary communication, which plays a crucial role in guiding online public opinion and mitigating crisis impacts.

2.2. Crisis communication and framing analysis

Framing analysis, first proposed by Goffman (1974), came from the idea of a “frame” and has been employed as a method in various disciplines and fields. A frame is a cognitive structure and process model, which enables people to “locate, perceive, identify, and label” the information surrounding them (Goffman, 1974). Framing analysis refers to the investigation of how individuals construct social reality, that is, people build their own understandings of issues through selecting some aspects and making them salient (Gamson, 1992; An & Gower, 2009). Framing analysis has the functions of defining problems, interpreting causes, making moral evaluations, and forming treatment recommendations (Entman, 1993). It has attracted considerable attention in fields such as cultural sociology, communication, and media coverage (Borah, 2011; An, 2011; An & Gower, 2009), social movements (Benford & Snow, 2000), linguistics (Tannen, 1993), and cognitive psychology (Lee, 1997). Tourism researchers have applied framing analysis to investigate hotel guest environmentally-friendly behavior (Kim & Kim, 2014), hotel booking intentions (Sparks & Browning, 2011), risk perceptions, destination crisis news coverage (Kapuściński & Richards, 2016; Liu & Pennington-Gray, 2015), image formation (Zhang, Zhang, Gursoy, & Fu, 2018), and public holiday timing (Wu, Xue, Morrison, & Leung, 2012).

Framing is powerful in defining and solving problems, and in shaping public opinion (Knight, 1999). In crisis communication, framing analysis can be used for the social construction and framing of a crisis, providing organizations with insights on suitable response strategies to minimize damage (Liu & Pennington-Gray, 2015; An & Gower, 2009; Der Meer, 2014). Media and public crisis framing are the two components of crisis framing analysis in communication (Scheufele, 1999).

Media crisis framing analysis is when an organization selectively enhances the salience of some aspects of a crisis through news coverage and media communication, thereby influencing public perceptions. For example, based on the Fukushima nuclear power station crisis, Choi and Lee (2017) explored how TEPCO (Tokyo Electric Power Company) restored its reputation by analyzing the frames used in its press releases. Public crisis framing analysis focuses on how individuals make sense of news and messages, which reveals a subjective interpretation and process model. For example, Kapuściński and Richards (2016) conducted a frame analysis of risk perceptions as a result of terrorism and political instability. They confirmed that risk perceptions in the risk-amplification framing were greater than in risk-attenuating framing. Despite their distinctiveness, these two framing analyses are intertwined and influence each other, resulting in informed public discourse. For example, Gerken, Der Land, & Der Meer (2016) employed semantic-network analysis to investigate the extent to which the framing of AirAsia's crisis communication was aligned with the public's framing of a crash, and it was a good indicator of the effectiveness of organisational crisis response.

2.3. Framing a crisis event

Previous researchers identified sets of crisis frames constructed by the media and the public. The main purposes of framing and social construction of a crisis is to understand the nature and cause of the crisis, how it should be managed, and its consequences (Ribeiro et al., 2018). Effective crisis communication requires knowing the characteristics and causes of the events at the outset (Coombs, 1999; 2006). Emergency responses, decisions on safety and security, and subsequent actions must be communicated to mitigate and recover from the negative impacts of crises. The types of crisis frames

are diverse. For media crisis frame analysis, Neuman, Just, and Crigler (1992) proposed that the frames used in news included conflict, economic consequences, human impact, and morality. An and Gower (2009) identified several different types of frames predominantly used in crisis news coverage: attribution of responsibility, human interest, conflict, morality, and economics. Situational crisis communication theory (SCCT) proposes various organizational crisis response strategies including denying, diminishing, and rebuilding, that form the crisis response frames of denial, apology, and ingratiation (Coombs, 2007). Shih, Wijaya, & Brossard (2008) proposed health-related frames composed of consequence, uncertainty, action, reassurance, conflict, and new evidence in communicating during a health-related crisis. Liu & Pennington-Gray (2015) analyzed five national newspapers news stories on the bed bug crisis in hotels and identified two dominant frames: attribution frame (episodic and thematic) and health-crisis frame (consequence, seriousness, uncertainty, action, reassurance, new evidence, and conflict). In public crisis frame analysis, Gerken et al. (2016) identified ten sub-frames to reflect how the public interpreted a crisis in social media in the case of crash of an AirAsia flight: accident-cause-frame, crashed-flight-frame, rescue-mission-frame, victim-frame, hope-frame, consolation-frame, spiritual-frame, emotional-support-frame, condolence-frame, and faith-frame. Investigating social media content on four crisis cases, Van Der Meer et al. (2014) proposed two public frames: confusion and information, and the frames predominantly used in different public opinion stages differed.

Therefore, the usage of crisis frames differs by crisis type (An & Gower, 2009), and it is necessary to identify a basic crisis frame model to achieve a general understanding of the portrayal of events. Essentially, a crisis is a low-probability, high-impact, and unpredictable event that threatens the individual and organizational survival and development (Fink, 1986; Fearn-Banks, 2016). Thus,

crises have inherent characteristics that include uncertainty, unpredictability, destructiveness, and being uncontrollable. These characteristics reflect the critical aspects of crises, and information communicated about them receives immediate attention from the media and public. A variety of frames locate, present, and label events, including problem definition, significance, familiarity/exoticness, controllable/uncontrollable, uncertainty, and seriousness in crisis communication. A crisis is also “an event for which people seek causes and make attributions” (Coombs & Holladay, 2004, p. 97). People want information about a crisis to determine its causes and those responsible through media crisis communication (An & Gower, 2009). According to attributional theory, people begin an attributional process when a negative, accidental, or important event occurs (Weiner, 1985). The public and media instigate information production and public opinion dissemination around the crisis cause and its responsibilities. Cause frames, such as attribution, causality and responsibility, background/victimisation, accidentalness, natural/man-made origins, and attribution of responsibility, are identified and proposed. Additionally, the crisis itself, and its management and communication are a dynamic, evolving, and chained process. For example, the crisis lifecycle has four stages, prodromal, acute, chronic, and resolution (Fink, 1986). The tourism disaster management framework includes the pre-event, prodromal, emergency, intermediate, long term (recovery), and resolution stages (Faulkner, 2001). Crisis processes and response frames such as announcement, policy description, conflict, crisis-denial, apology, action and reassurance, rescue-mission, emotional-support, and consolation, have been suggested to stimulate organizational and public attention and information dissemination on the development of and responses to crisis events. Furthermore, crisis events tend to have negative outcomes. Their damage is not only an indicator for measuring destructiveness (Novelli, Burgess, Jones, & Ritchie,

2018), defining the nature of the crisis, but also a crucial element discussed and framed by the public and in the media during crisis communication. The existing research has produced a variety of results including economic repercussions, consequences, condolences, spirituality, labor market integration, catastrophic effects, and negative frames to illustrate how the public and media perceive, label, locate, and evaluate the impact of crises.

Combining frame theory and the existing crisis frames (Appendix 1), this research proposes that the public framing of a crisis through online media includes four basic frames: nature, cause, process, and result. The *nature frame* refers to the set of inherent attributes and core characteristics of a crisis, reflecting the basic facts about its occurrence. The *cause frame* represents the sources or related factors that lead to the crisis, including natural and man-made events. The *process frame* is the development and evolution of a crisis event (crisis life-cycle), as well as the response and management strategies adopted by organizations and the public. The *result frame* is the consequences, including the injuries and deaths, economic losses, and other catastrophic effects, tangible and intangible.

Appendix 1. Description of crisis frames and sub-frames.

Crisis frame	Category	Descriptions	Crisis type	References
Nature frame	Problem definition	The nature of the crisis	Zika crisis	Ribeiro et al. (2018)
	Morality frame	Places the frame of the event, problem, or issue in the context of morals, social prescriptions, and religious tenets.	Business crisis	An & Gower (2009); An (2011)
	Significance	Emphasizing and acknowledging the critical importance of disaster, and its relief and response.	Wenchuan earthquake	Liu & Boin (2020)
	Familiar/exotic	Frequency and familiarity crisis events	Terrorism, political instability	Kapuściński & Richards (2016)
	Controllable/uncontrollable	Whether the consequences of a crisis event are controllable		

	Criminality frame	A problem-oriented image is promoted by associating refugees with illegal modes of transportation, and by creating an atmosphere of suspicion and prejudice	Refugee crisis	Greussing & Boomgaarden (2017)
	Securitization frame	The stereotyped portrayal of refugees as an uncontrollable, dehumanised mass		
	Uncertainty	Reported on different aspects of bed bug infestation, such as causes, cures and possible spread	Bed bug crisis	Liu & Pennington-Gray (2015)
	Seriousness	Suggested that bed bug infestation was a serious issue	Bed bug crisis	Liu & Pennington-Gray (2015)
Cause frame	Attribution frames	A way of attributing responsibility for a cause or solution to either the government or to an individual or group of people	Bed bug crisis; Fukushima nuclear power station crisis; air crash	Liu & Pennington-Gray (2015); Choi & Lee (2017); An & Gower (2009); Gerken et al. (2016)
	Causality and responsibility	Attributing the cause or the crisis responsibility to natural forces rather than human error	Wenchuan earthquake	Liu & Boin (2020);
	Background/victimisation frame	Refugees are portrayed as passive victims of circumstances for which they are not responsible	Refugee crisis	Greussing & Boomgaarden (2017)
	Accidental frame	Crisis events are caused by accidental or uncontrollable factors	Business crisis	Cho & Gower (2006)
	Natural/man-made	Attributing the cause or the crisis responsibility to natural forces or human error	Terrorism, political instability	Kapuściński & Richards (2016)
Process frame	Announcement	Particularly important notices or statements given by the company, which the company feels the public should be more aware of	Fukushima nuclear power station crisis	Choi & Lee (2017)
	Policy prescription	The performance of policy systems, the changes of politics or institutions, as well as the statements with policy propositions	Wenchuan earthquake	Liu & Boin (2020)
	Human interest	A human face or an emotional angle is added to the presentation of an event, issue, or problem	Business crisis	An & Gower (2009)
	Crisis-denial frame	An attempt to remove connections between an organization and a crisis	Max Havelaar crisis	Der Meer (2014)
	Apology frame	An organization takes full responsibility for a crisis and asks stakeholders for forgiveness	Fukushima nuclear power station crisis	Choi & Lee (2017)
	Conflict	Used in such a way as to reflect conflict and disagreement among individuals, groups, or organizations		Liu & Pennington-Gray (2015); An & Gower (2009)
	New evidence	Reported new evidence that help advance the understanding of bed bugs	Bed bug crisis	Liu & Pennington-Gray (2015)

	Action and reassurance	Covered actions taken against bed bug infestation, and expressed the idea that public should not be worried about it		Liu & Pennington-Gray (2015)
	Settlement frame	Temporary and permanent settlements, and administrative aspects of the refugees' arrival	Refugee crisis	Greussing & Boomgaarden (2017)
	Humanitarianism frame			
	Reception/distribution frame			
	Rescue-mission-frame	Set up a team to implement rescue missions	Air crash	Gerken et al. (2016)
	emotional-support-frame	Actions taken to comfort and emotionally support the people affected by the crisis		
	consolation-frame			
Result frame	Economic frame	Reports an event, problem, or issue in terms of the consequences it will have economically on individuals, groups, organizations, or countries	Business crisis	An & Gower (2009)
	Consequence	Discussed the consequences (damage) of bed bug infestation (terrorism and political instability)	Bed bug crisis; Terrorism, political instability	Liu & Pennington-Gray (2015); Kapuściński & Richards (2016)
	condolence-frame	The impact of crisis events on the individual's spiritual, hope, and emotion	Air crash	Gerken et al. (2016)
	spiritual-frame			
	hope-frame			
	Labor market integration frame	Long-term consequences of the crisis on labour market, including hopes and concerns regarding social integration, economic change, and employment	Refugee crisis	Greussing & Boomgaarden (2017)
	Economization frame	Perpetuates the image of refugees as an economic burden and threat to host country prosperity and welfare		
	Catastrophic effects	The catastrophic and negative effects of the crisis	Terrorism, political instability	Kapuściński & Richards (2016)
Negative/negative effect				

2.4. Effects of crisis frames on travel intentions

Travel intentions are the willingness and wishes of tourists to visit destinations, which reflect not only basic desire and general intentions to travel (Larsen, Brun, Øgaard, & Selstad, 2011), but also

intentions to visit specific destinations (Chen, Shang, & Li, 2014). The relationship between crises and travel intentions has received significant scholarly attention.

Most researchers have found that crisis events reduce travel intentions (Sano & Sano, 2019; Liu-Lastres et al., 2019). The more severe the crisis consequences, the lower are travel intentions, and the slower is the recovery of tourist demand (Jonas, Mansfeld, Paz, & Potasman, 2011). The volume of public opinion in online postings, discussions, and communications, reflects the attitudes, emotions, and future travel intentions of potential tourists. Online discussion and dissemination of information on crises within destinations affect people's travel intentions. For example, with the background of "Occupy Central" in Hong Kong, Luo and Zhai (2017) found that people's secondary crisis communication on social media affected potential tourists' emotions, triggered group conflicts, and social contradictions, and then produced a tourism boycott. Brown (2015) confirmed that the public opinion crisis triggered by a murder had a negative impact on the inbound tourist demand for Aruba. She argued that long-term media storms formed by tourism crisis events raised doubts about a destination's ability to protect tourists, which would prevent others from visiting due to safety concerns. In addition, people's responses to tourism crisis frames have been empirically investigated. For example, Kapuściński and Richards (2016) and Xie et al. (2021) confirmed that tourism crisis and risk frames significantly impacted perceived risk, perceived safety, and travel intentions, and the influence paths and intensity depended on the types of frames. In destination crisis communication, the information related to the nature, causes, processes, and results are the four basic frames communicated online. The levels of attention, discussion, and communication about these frames influence the aggregation and growth of public opinion volume. Since crises are accompanied by negative results, such as casualties, property damage, and economic stagnation, these four frames are

often given negative labels. Thus, the greater the public opinion volume on frames, the lower the public safety perceptions and the stronger are the negative travel intentions. Thus, hypothesis 1 was proposed as:

Hypothesis 1: Crisis frames in online communication have a positive and dynamic effect on negative travel intentions

Disturbance information refers to internal and external information and messages that cause undesirable or unexpected changes in public opinion during crisis communication. Fink (1986) suggests that a crisis itself and its management and communication successively experience four stages: prodromal, acute, chronic, and resolution. Thus, negative disturbance information (NDI) is the internal and external information elements that cause crisis public opinion to deviate from the originally expected evolution process. NDI triggers the rapid accumulation of public opinion, leading to a secondary crisis. Generally, significant news reports and negative or inaccurate communication about destinations readily becomes NDI that affects public opinion during a tourism crisis. For example, based on the Beijing 798 Yitel hotel incident, Su, Stepchenkova, & Kirilenko (2019) explored public online responses and the resulting public opinion crisis caused by inappropriate responses and efforts of crisis communication and image restoration. Adverse communication efforts, such as over-revealed crisis information, inaccurate or misleading statements involving the assignment of blame to others, and failed crisis communication and responses, stimulate more rapid accumulation of public opinion, thereby negatively influencing opinion evolution (Lean & Smyth, 2009).

According to SCCT, organizations adopt appropriate crisis response strategies based on specific

crisis types and attribution of responsibility to maximize reputational protection and mitigate crisis damage (Coombs, 2007). Victimized crises produce the weakest attributions of organizational crisis responsibility, while preventable crises have the strongest attributions. Organizations should use rebuilding response strategies (e.g., compensation and apologies) with the strongest attributions of crisis responsibility (i.e., preventable crisis) and adopt diminishing responses (e.g., excuses and justifications) with the least attributions of crisis responsibility (i.e., accidental crisis) to restore their images. Denial response strategies such as attacking accusers, denial, and scapegoating can be adopted when the organization the victim of the crisis (i.e., victimized crisis) (Coombs, 2007). Thus, organizations should adopt appropriate response strategies according to the attribution of responsibility to achieve optimal coping effectiveness. Inappropriate strategies may exacerbate the negative impacts of a crisis and even trigger a secondary crisis. Although the Thailand drownings had several causes, including bad weather, lack of warning, ship safety, and the failure of captains, the Thai government should have assumed partial responsibility due to inadequate market supervision. However, a senior Thai official issued inaccurate and blame-passing statements and adopted a denial response strategy, attempting to reduce crisis impact by transferring all responsibility to other organizations and individuals. The “disclaimer statements” became NDI that created unexpected changes in public opinion, and aggravated the negative impacts of the drownings. Negative travel intention responses to crisis frames (nature, cause, process, and result) were more intense after the NDI appeared. In other words, NDI moderated the impacts of crisis frames on negative travel intentions. Therefore, Hypothesis 2 was proposed as:

Hypothesis 2: Negative disturbance information strengthens the impact of crisis frames of online communication on negative travel intentions

According to the attributional theory proposed by Weiner (1985), individuals begin an attributional process when a crisis happens. When people attribute crisis responsibility to internal organizational causes, they may be angry; by contrast, when attributed to external causes, emotions of sympathy and tolerance may result. The inaccurate statements from Thai officials (NDI) caused people to further attribute the crisis, inducing them to reframe the event and generate secondary crisis communication. Public online generated crisis frames are readily stimulated and strengthened by NDI, causing greater accumulation of public opinion in a short period and affecting the volume and tenor of public opinion. In addition, the development of potential negative travel intentions is a dynamic decision-making process in tourism crises (Yousaf & Samreen, 2016). Negative travel intentions online can be collective and instant expressions of anger and may result in boycotts of destinations in secondary communication (Luo & Zhai, 2017). In destination crisis communication, “horror stories” reported by the media as well as failed emergency responses by destinations may create negative destination images (Bradbury, 2013) and travel intentions (Brown, 2015). Negative emotions are readily stimulated by NDI, which can elevate the volume of public expression about crisis frames and increase negative travel intentions. Therefore, Hypothesis 3 was proposed as:

Hypothesis 3: Negative disturbance information has a positive and dynamic effect on crisis frames of online communication (H3a) and negative travel intentions (H3b)

The conceptual model for this research is shown in Figure 1.

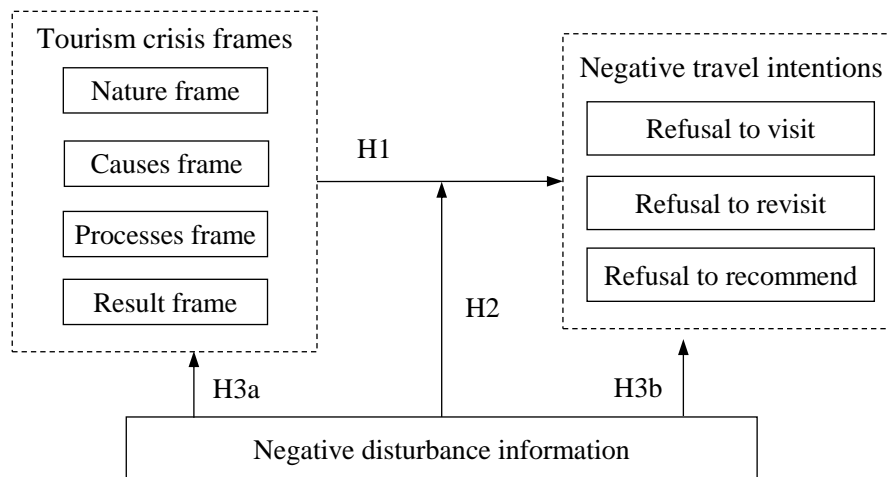


Fig. 1. Conceptual model

3. Research design

3.1. Research background

On July 5, 2018 (Thailand time), the “Princess Aisha” with 42 tourists and the “Phoenix” with 105 tourists encountered a severe storm on their way back to Phuket. They capsized and sank near Coral Island and Meitong Island, killing 47 Chinese tourists. News of the accident was widely spread in online platforms and communities within China because many Chinese tourists were injured and killed. On July 9, a senior Thai official said in an interview that the drownings were the result of “the Chinese harming themselves”, caused by an “illegal ‘zero-yuan group’ and the Chinese” and “had nothing to do with the Thai government.” These statements inflamed strong negative public opinion in China against Thailand and became significant disturbance information in the online crisis communication of the cruise boat disaster. Several Chinese tourists who originally planned to travel to Thailand canceled their trips after the incident, and the Chinese tourism market to Thailand rapidly declined.

3.2. Data collection, measurement, and analysis

3.2.1. Data collection

Three Ph.Ds. in the field of tourism public opinion selected 436 mainstream and open online Chinese media as the data collection platforms, including news websites, fora, Tieba, Weibo, and WeChat. Published content on the Thailand cruise-boat disaster on these platforms was collected using crawler technology. Information generated from the platforms was collected by the keyword matching method and retrieved every five minutes. Online news and posts related to the Thailand incident were gathered, and an original public opinion information database was formed.

The data set included original text and text-converted information from photos, videos, and other images. The online public opinion information collection system (OPOICS) was launched for data collection on July 5 and lasted for 30 days. Since the volume of data on the key variables in this research shrank into the single digits on July 15, the data for analysis were distributed from July 5 to 15.

3.2.2. Measurement

After cleaning and removing duplicate content, advertising information, and spam, 112,313 comments and posts were retained and formed the original database on the drownings. As mentioned, the crisis frames for public online communication consisted of four dimensions: nature, causes, processes, and results. According to the sub-crisis frames identified and summarized in Appendix 1, the initial measurements of these four crisis frames were generated. The four crisis frames were assigned and counted from the original database as well. Combining the scales commonly used for tourist intentions (Lam & Hsu, 2006; Jalilvand, Samiei, Dini, & Manzari, 2012)

and the original database, three measurements of negative travel intentions were developed: refusal to visit, refusal to revisit, and refusal to recommend. NDI was measured by the questionable statements of senior Thai officials. According to the relevant crisis framing research, variables were tagged, labeled, and measured based on the keyword attributes of the original database (Wu et al., 2012; Liu & Pennington-Gray, 2015; Gerken et al., 2016). Content analysis was used to identify keywords. Three Ph.D. students in tourism safety and security randomly selected 2,000 posts and comments to extract keywords, and no more new keywords were identified after reviewing more than 1,500 posts (Table 1). One Ph.D. student first coded, extracted, and categorized the text, and a second assessed the results with closed-ended (i.e., agree-disagree) responses. Finally, three Ph.D. students discussed any disagreements to improve the extraction and classification validity. Then, three Ph.D. students proofread and checked the tagged data, and manually assigned values to comments and posts that failed to be identified, and assessed the data with multiple tags. In addition, two experts in tourism crisis communication were invited to evaluate the keyword extraction, variable labeling rules, statistical procedures, and the labeled results. After discussion and exchange of views, the labeling and coding rules were adjusted and optimized, improving the validity of data categorization.

Table 1. Basic keywords for variables.

Variables	Keywords
N	Accident; disaster; act of God; man-made disaster; calamity; natural disaster; shipwreck; capsized accident; irresistible; resistible; suddenly; unusual; unpredictable; inevitable; mishap + Thailand or Phuket island
C	Weather; storm; extreme weather; rainstorm; severe weather; rough sea; strong breeze; safety awareness; take off life jacket; demand to go to sea; venture out to sea; sneak out to sea; Disorder management; disregard the warning; lack of warning; risk consciousness; safety common sense; fluke mind; capricious; put pressure on tour guide; complaint +

		Thailand or Phuket island
P		Capsizing; overturning; tipping; falling; shaking; wagging; trapped; floating; drifting; bumping; devouring; jumping ship; washed away; swept away; drift away; salvage; rescue; salvation; evacuate; escort; assist; save; lifeline; relief; emergency maintenance; searching; seeking; startling process; lifeboat; rescue ship; disaster relief status + process and Thailand or Phuket island
R		Deaths; killed; dead; drown; fatal; remain; drowning; corpse; casualty; injury; missing; severe wound; slight wound; patient; in hospital; treatment; surgery; damage; loss; compensation + result and Thailand or Phuket island
NDI		flge (<i>shuai guo</i>); scapegoat; buck-passing; the Chinese hurt the Chinese; Chinese harm themselves; the responsibility is the Chinese in charge of the ship; illegal “zero yuan group”; not related to Thailand + vice-premier and Thailand or Phuket island
NTI	Refuse to visit	Refuse; boycott; cancel; countermand; adjourn; don’t go; never; dare not; don’t want to go; unwilling to go; cannot go; not intend to go; won’t go; force-out; shut down; not worth going; decline; other option; domestic travel; change route; nothing to go to; not reason to go; not necessary to go; stay home; why go to + intention and Thailand or Phuket island
	Refuse to revisit	Never go again; don’t consider going again; won’t go again; don’t want to go again; don’t plan to go again; originally planned to go again; don’t go again; regret going; stop going again; can’t go again; still going? still want to go? + intention and Thailand or Phuket island
	Refuse to recommend	Not recommend; not introduction; don’t go all; nobody goes; call for boycott + intention and Thailand or Phuket island
Note: N = Nature frame, C = Cause frame, P = Process frame, R = Result frame, NTI = Negative travel intention, NDI = Negative disturbance information.		

The data for each variable with labeling were proofread and checked, and 69,908 valid comments and posts were obtained (Figure 2). To clearly present the time serial characteristics of variables and response relationships, the volume of public opinion was counted in units of hours, and finally formed time-series data for each variable. For example, the amount data related to crisis

nature was X1 from 00:00 on July 5 to 00:59 on July 5, and the public opinion volume on nature frame of this crisis was X1 at 0 o' clock on July 5. Time-series data on crisis frames, NDI, and negative travel intentions were collected from 00.00 on 5 July to 23:59 on 15 July 2018.

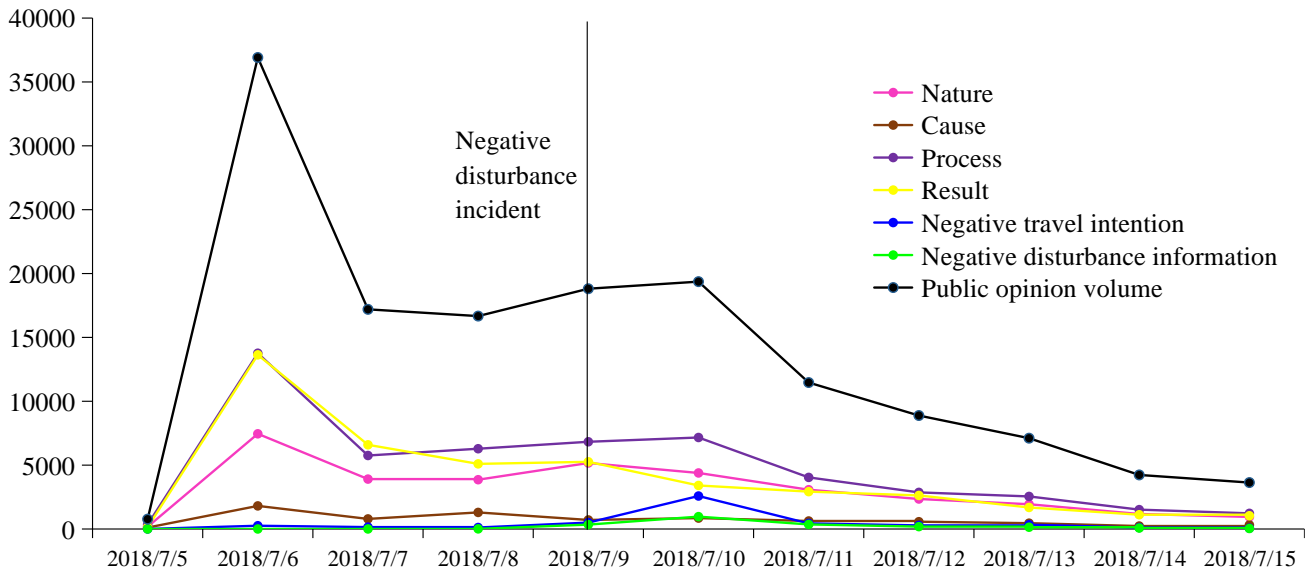


Fig. 2. Descriptive statistics of public opinion volume.

3.2.3. Data analysis

Public opinion can change with time and there may be relationships and interactions among variables, including negative travel intentions, NDI, and crisis frames. The public opinion volume generated in a prior stage may affect the volume in a following stage. Thus, this research employed the Vector auto-regressive (VAR) technique proposed by Sims (1980) to capture and analyze the long-term dynamic effects among crisis frames, negative travel intentions, and NDI. VAR is a non-structural equation model that predicts multiple time-series variables and the dynamic effect of a random disturbance variable to a system. Most importantly, it is less constrained by theory because all variables are treated as endogenous and are systematically estimated. The VAR model proposed was as follows:

$$y_t = A_1 y_{t-1} + \dots + A_p y_{t-p} + B_1 x_{t-1} + \dots + B_r x_{t-r} + \varepsilon_t \quad (\text{a})$$

Where y_t is a vector composed of endogenous variable; A_1, \dots, A_p and B_1, \dots, B_r is the matrix to be estimated, ε_t is a random perturbation vector; t is the lag order; x_t is an exogenous variable. Before employing the impulse response function and variance decomposition, the stationarity and Granger causality tests of related variables are performed. The augmented Dickey-Fuller (ADF) test was used to examine the stationarity of each data series and to avoid “spurious regression” and ensure sequence stability. Second, the Akaike information (AIC), Schwarz (SC), and Hannan-Quinn (HQ) criteria determined the optimal lag period. Third, the Granger causality tested the causal relationship among crisis frames, negative travel intentions, and NDI. Finally, the impulse response function and variance decomposition were employed to uncover the dynamic relationships among variables within 24 hours. The impulse response function describes the impact of an error term when adding a standard deviation to the current and future values of endogenous variables.

The tourism crisis frames served as the independent variables, negative travel intentions were the dependent variable, and NDI was a moderation variable. The dynamic relationships between tourism crisis frames and negative travel intentions were examined based on public opinion volume data, as well as the moderating and strengthening effects of NDI. The tourism crisis frames for public online communication included four elements: nature, causes, processes, and results, reflecting public’s perceptions, labeling, meaning construction, and online communication of this crisis event in Thailand.

4. Results

4.1. Stationarity test of time-series data

Unit-root tests were used to examine the stationarity of 16 data series (Table 2). The ADF test results indicated that all sequences of variables in the sample and the sample after the NDI were stationary at the 1% significance level. In the sample before the NDI, the variable sequences of causes and negative travel intentions were stationary in order 0, namely $I(0)$., and the variable sequences of nature, processes and results were stationary in order 1, namely $I(1)$. Thus, the results were consistent with the premises of the Granger causality test and VAR model.

Table 2. Results of unit-root tests.

Sample	Variables	Number	(c, t, k)	ADF value	Prob.	Critical value			Conclusion
						1%	5%	10%	
Whole sample (07.05 - 07.15)	N	34,439	(c,0,0)	-4.6232	0.0002	-3.4551	-2.8723	-2.5726	Stable
	C	7,782	(c,t,0)	-6.5353	0.0000	-3.9933	-3.4270	-3.1368	Stable
	P	52,340	(c,t,0)	-4.5092	0.0017	-3.9933	-3.4270	-3.1368	Stable
	R	43,523	(c,t,0)	-4.6603	0.0010	-3.9933	-3.4270	-3.1368	Stable
	NTI	4,846	(c,0,1)	-7.2642	0.0000	-3.4552	-2.8724	-2.5726	Stable
Before negative disturbance incident (07.05 - 07.08)	dN	15,396	(0,0,0)	-10.0547	0.0000	-2.5898	-1.9443	-1.6145	Stable
	C	4,010	(c,0,0)	-3.9442	0.0026	-3.5007	-2.8922	-2.5832	Stable
	dP	26,147	(0,0,0)	-11.7276	0.0000	-2.5898	-1.9443	-1.6145	Stable
	dR	25,461	(0,0,0)	-10.9476	0.0000	-2.5898	-1.9443	-1.6145	Stable
	NTI	527	(c,0,0)	-3.8582	0.0034	-3.5007	-2.8922	-2.5832	Stable
After negative disturbance incident (07.09 - 07.15)	N	19,043	(c,t,1)	-6.6319	0.0000	-4.0143	-3.4371	-3.1427	Stable
	C	3,772	(c,t,0)	-5.5395	0.0000	-4.0139	-3.4370	-3.1426	Stable
	P	26,193	(c,t,2)	-4.6740	0.0011	-4.0146	-3.4373	-3.1428	Stable
	R	18,065	(c,t,0)	-6.2936	0.0000	-4.0139	-3.4370	-3.1426	Stable
	NTI	4,319	(c,t,1)	-6.2837	0.0000	-4.0143	-3.4371	-3.1427	Stable
	NDI	2,114	(c,t,0)	-4.3390	0.0035	-4.0139	-3.4370	-3.1426	Stable

Notes: c, t, and k represent the intercept, time trend, and lag order in the unit root test model, respectively. The optimal lag period is determined by Akaike information criterion (AIC). The d represent the first difference transformation.

4.2. Dynamic response process of crisis frames and negative travel intentions

4.2.1. Granger causality test

This research proposed a VAR model composed of four crisis frames and negative travel intentions, and an optimal lag period of 1, namely VAR_a(1). As presented in Table 3, the results of the Granger causality test showed that the four frames caused independent and collective changes in negative travel intentions ($\chi^2 = 55.24$, $p = 0.000$). This means a change in public opinion about the crisis frames contributed to changes in travel intentions. These results justified the rationale and validity for constructing VAR_a(1).

Table 3. Granger causality test

Model	Dependent variable	Exclude Value	N	C	P	R	All	NDI	Hypothesis
VAR _a (1)	NTI (whole)	Chi-sq	8.2323	5.5401	13.2525	30.5706	55.2386	-	H1
		Prob.	0.0041	0.01860	0.00030	0.0000	0.0000	-	
VAR _b (3)	NTI (before)	Chi-sq	4.3146	0.4176	3.5690	8.1057	29.9564	-	H2
		Prob.	0.22940	0.9366	0.3119	0.0439	0.0028	-	
VAR _c (3)	NTI (after)	Chi-sq	13.2257	0.9483	61.6010	54.5111	156.164	-	H2a
		Prob.	0.0042	0.8138	0.0000	0.0000	0.0000	-	
VAR _d (3)	NTI (after)	Chi-sq	-	-	-	-	-	39.6606	H2a
		Prob.	-	-	-	-	-	0.0000	
VAR _e (2)	N (after)	Chi-sq	-	-	-	-	-	12.3843	H2b
		Prob.	-	-	-	-	-	0.0020	
VAR _f (3)	C (after)	Chi-sq	-	-	-	-	-	8.8986	H2b
		Prob.	-	-	-	-	-	0.0307	
VAR _g (5)	P (after)	Chi-sq	-	-	-	-	-	44.3812	H2b
		Prob.	-	-	-	-	-	0.0000	
VAR _h (5)	R (after)	Chi-sq	-	-	-	-	-	31.4872	H2b
		Prob.	-	-	-	-	-	0.0000	

4.2.2. Impulse response function between crisis frames and negative travel intentions

The dynamic response process of the four crisis frames and negative travel intentions, that is VAR_a

(1), is shown in Figure 3. The vertical axis represents the impulse response function of negative travel intentions, and the horizontal axis is the number of impact response periods set to 24 hours. The dashed lines are the upper and lower confidence intervals of the function value, and the solid line is the impulse response function of the value, which indicates the dynamic influence of public opinion volume and information communication frames about the incident on negative travel intentions.

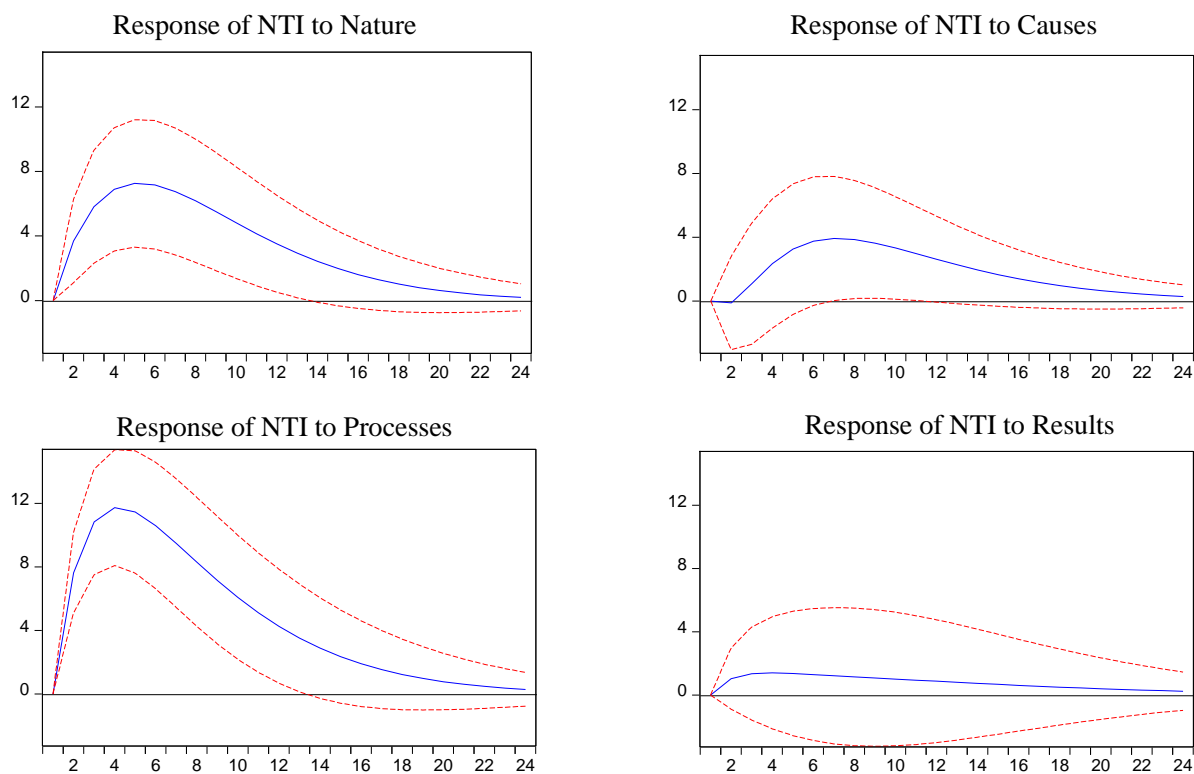


Fig. 3. Impulse response function of $VAR_a(1)$

The solid crisis frame line indicates the dynamic response process of negative travel intentions under the impact of the crisis frames. By giving a positive standard deviation shock to the nature, negative travel intentions rose rapidly and reached a peak value in the fifth lag stage, and then quickly declined to zero. Doing likewise with causes, negative travel intentions exhibited three stages of steady, rapid increases, and then a slow decline, and attained a peak value in the fifth lag

stage. The dynamic response of negative travel intentions to processes was consistent with nature; and the response of negative travel intentions to results indicated stable upward and downward trends. The dynamic responses of negative travel intentions to the crisis frames were all positive and decreased to zero eventually. In addition, the response of negative travel intentions to processes was the strongest, followed by nature. The responses of negative travel intentions to results and causes were weak, negative travel intentions were only slightly affected in the early stages.

4.2.3. Variance decomposition of NTI

The Cholesky variance decomposition method was applied on the dynamic relationship between crisis frames and negative travel intentions, and the periods set to 24 hours. Processes contributed the highest negative travel intention variance and this variance contribution gradually increased from the first period and reached 30.3% in the 10th period, and finally settled at around 31% (Table 4). The variance contribution of nature to negative travel intentions ranked second and remained at 13.8% in the 24th period. Causes and results had lower variance contributions to negative travel intentions, with causes accounting for 4.2% and results for 0.65%. Therefore, crisis frames had a positive and dynamic impact on negative intentions, supporting H1.

Table 4. Variance decomposition

Independent variable	Dependent variable	Sample	Period					
			1	5	10	15	20	24
N	NTI	Whole sample	0.0000	7.4694	12.6845	13.7124	13.8275	13.8320
C			0.0000	0.8759	3.2391	4.0436	4.1997	4.2204
P			0.0000	22.4769	30.3020	31.1918	31.2683	31.2706
R			0.0000	0.3412	0.5055	0.5970	0.6386	0.6508
dN	NTI	Before	0.0000	5.4089	8.1449	8.1733	8.1681	8.1720
C			0.0000	3.0522	3.2757	3.2385	3.2337	3.2325

<i>dP</i>			0.0000	15.0062	16.0492	16.5680	16.6028	16.5998	
<i>dR</i>			0.0000	7.6296	7.0609	7.0064	7.0162	7.0160	
N			0.0000	3.0448	3.6632	3.6861	3.6996	3.7027	
C	NTI	After	0.0000	7.0379	8.9180	8.9068	8.9127	8.9127	
P			0.0000	47.5819	46.9350	47.1800	47.2097	47.2159	
R			0.0000	10.6256	11.6509	11.5338	11.5155	11.5131	
			0.0000	19.4218	30.9632	31.9094	32.2277	32.2937	
			8.7609	15.5816	23.1395	24.4244	24.7133	24.7721	
NDI		After	C	17.8791	22.7067	25.5666	26.4114	26.6533	26.7159
	P		8.0607	28.4664	24.8383	24.6195	24.8418	24.9220	
	R		10.5336	22.0077	20.2319	20.8259	21.5186	21.7075	

4.3. Dynamic response process of crisis frames to negative travel intentions before the occurrence of NDI

The effect of NDI on the dynamic relationship between crisis frames and negative travel intentions was analyzed. The whole sample was separated into two sub-samples based on the occurrence time of the NDI (2018.07.09). The dynamic response function between the four crisis frames and negative travel intentions was investigated before and after the negative disturbance incident. The dynamic strengthening effect of NDI on negative travel intentions was also explored.

A VAR_b(3) model was developed to present the dynamic response relationship between crisis frames and negative travel intentions based upon the sub-sample before the NDI. The results of the Granger causality test indicated that the crisis frames collectively caused changes in negative travel intentions ($\chi^2 = 29.96$, $p = 0.003$), which justified the rationale and validity for constructing VAR_b(3). The dynamic response function before the negative disturbance incident is shown in Figure 4. When the four frames were given positive standard deviation shocks, respectively, negative travel

intentions rose and rapidly reached a peak value, and then dropped to zero. The variance contribution of the four frames increased from zero in the first period. Processes contributed the highest negative travel intention variance and remained at around 16% in the sixth period; causes accounted for the lowest negative travel intention variance and remained at around 3% in the fourth period.

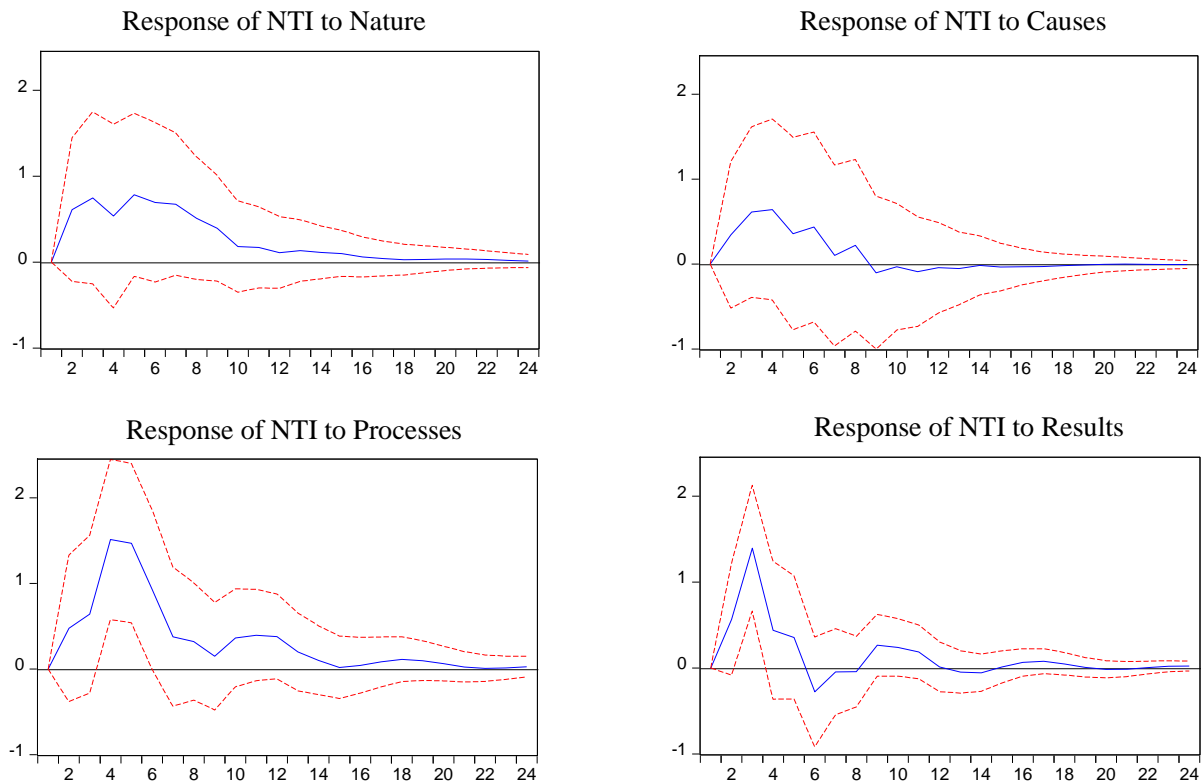


Fig. 4. Impulse response function of VAR_b (3)

4.4. Dynamic response process of crisis frames (after) to negative travel intentions after the occurrence of NDI

The Granger causality test indicated the crisis frames caused changes in negative travel intentions ($\chi^2 = 156.16, p = 0.000$). The dynamic response functions after the NDI between crisis frames and negative travel intentions are shown in Figure 5, and they were all above the horizontal axis. When the four frames were given positive standard deviation shocks, negative travel intentions rose and

rapidly reached a peak value, and then gradually dropped to zero. Processes contributed the highest negative travel intention variance and remained at around 47% in the eleventh period. Nature accounted for the lowest variance and was at around 3.7%. Thus, the impulse response functions of crisis fames to negative travel intentions were more severe and stronger after the NDI, and the cumulative variance contribution (71.34%) was also much higher than before (35.02%). Thus, NDI strengthened the dynamic impact of crisis frames on negative travel intentions, supporting H2.

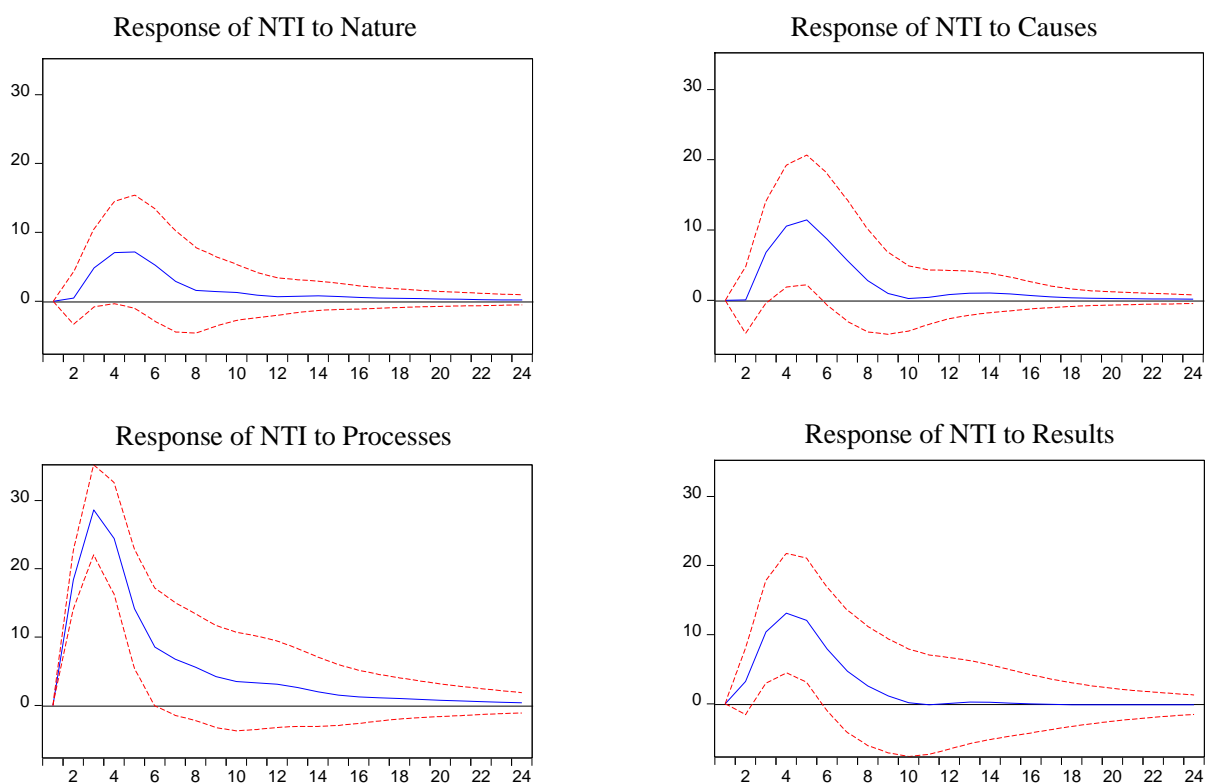


Fig. 5. Impulse response function of $VAR_c(3)$

4.5. Dynamic enhanced impact of NDI

Five VAR (VAR_{d-g}) models were developed to examine the dynamic impacts on travel intentions and crisis fames produced by NDI based on the sub-sample after the NDI. As shown in Table 3, NDI caused changes in negative travel intentions ($\chi^2 = 39.66$, $p = 0.00$), nature ($\chi^2 = 12.38$, $p = 0.00$),

causes ($\chi^2 = 8.899$, $p = 0.03$), processes ($\chi^2 = 44.38$, $p = 0.00$), and results ($\chi^2 = 31.49$, $p = 0.00$).

$\text{VAR}_d(3)$, $\text{VAR}_e(2)$, $\text{VAR}_f(3)$, $\text{VAR}_g(5)$ and $\text{VAR}_h(5)$ were constructed when combined with optimal lag period selection criteria.

As presented in Figure 6a, when given a positive standard deviation shock to NDI, negative travel intentions rose rapidly and reached a peak value in the fifth lag stage, and then dropped to zero gradually, and the variance contribution reached 32.3% in the 24th period. In addition, the impulse response function of NDI to crisis frames had a positive N-shape. The variance contribution of NDI to causes was high, at 17.9% in the first period, and stayed above 26% after the 12th period. The variance contribution of NDI to nature and processes remained at around 24% in the 24th period; and the variance contribution of NDI to results fell between 7.9% and 21.7%. Thus, NDI had a positive and dynamic impact on crisis frames and negative travel intentions, among which the enhanced impacts on negative travel intentions and causes were high. Therefore, H3a and H3b were supported.

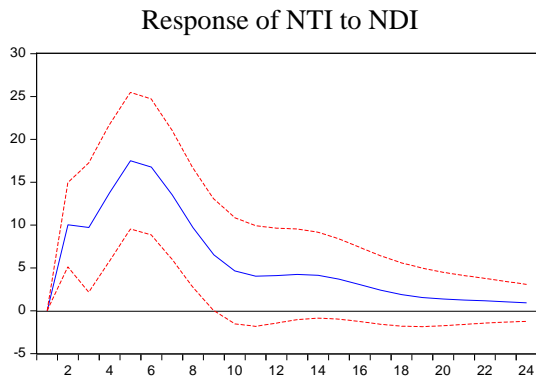


Fig. 6a. VAR_d(3) - NTI

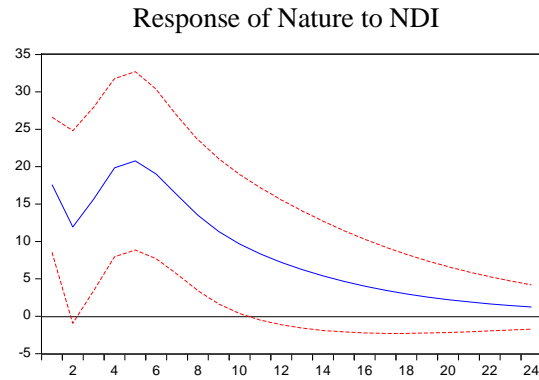


Fig. 6b. VAR_e(2) - Nature

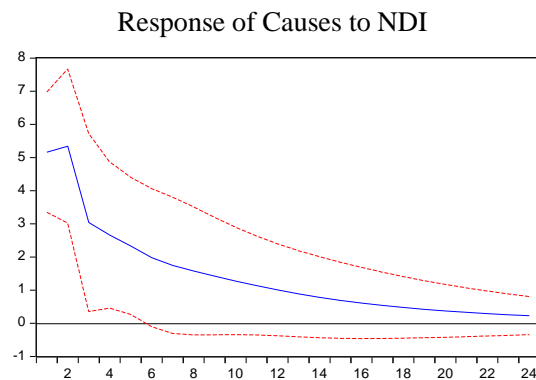


Fig. 6c. VAR_f(3) - Cause

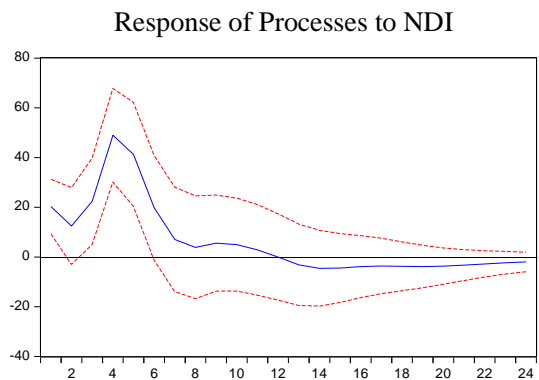


Fig. 6d. VAR_g(5) - Process

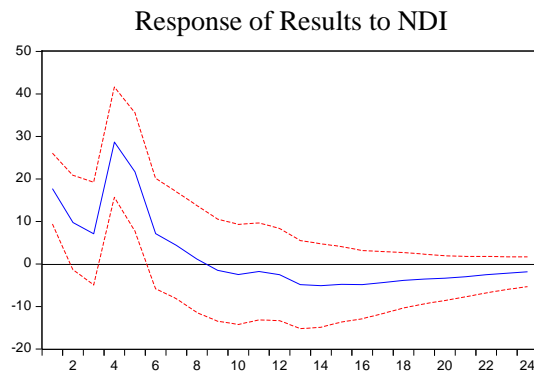


Fig. 6e. VAR_h(5) - Result

4.6. Robustness check

Binomial logistic regression was applied to test the relationship between crisis frames and travel intentions. Binary logistic regression is a type of generalized linear model that shows how a binary response is dependent on a set of independent variables. Binary response means that there can only

be two possible outcomes. The crisis frames were the independent variables (X), and travel intentions were the dependent variable (Y). The independent variables were represented by $X = (X_1, X_2, X_3, X_4)$ with observed value of 1 (if it happened) or 0 (if it did not), and Y was the binary response variable where $Y_k = 1$ if negative travel intentions happened, and $Y_k = 0$ if not. The probability (p) that negative travel intentions happened was formulated as follows:

$$\ln(p/1-p) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 \cdots \beta_k X_k + \delta \quad (k=1,2,3,\dots,n) \quad (1)$$

Where β_k was the logistic regression coefficient, which determined the impact of crisis frames on travel intentions.

Five binary logistic regression models (M1-M5) were developed, and the results are presented in Table 5. Model 1 is the logistic regression model of nature and negative travel intentions, which was significant [$\chi^2 (df = 1) = 2723.995, p < 0.00$], and indicated that nature had a positive impact on negative travel intentions ($\beta = 1.822, p < 0.00$). Model 2, the logistic regression model of causes and negative travel intentions, was significant [$\chi^2 (df = 1) = 3291.2, p < 0.00$], and showed that causes had a positive impact ($\beta = 1.11, p < 0.00$). Model 3, the logistic regression model of processes and negative travel intentions, was significant [$\chi^2 (df = 1) = 6638.22, p < 0.00$], with processes having a positive impact ($\beta = 2.61, p < 0.00$). Model 4, the logistic regression model of results and negative travel intentions, was significant [$\chi^2 (df = 1) = 4448.33, p < 0.00$], with results having a positive impact ($\beta = 2.21, p < 0.00$). Model 5, the logistic regression model of the four frames and negative travel intentions, was also significant [$\chi^2 (df = 4) = 13513.34, p < 0.00$], indicating that the four frames had a positive impacts independently and collectively. Compared with models M1-M4, Model 5 had a better goodness of fit, and its Nagelkerke R-squared (0.444) was the highest.

Therefore, the results demonstrated good robustness, and the four frames significantly predicted negative travel intentions.

Table 5. Logistic regression analysis

Variables	Dependent variable: NTI									
	Model 1		Model 2		Model 3		Model 4		Model 5	
	β	S.E.	β	S.E.	β	S.E.	β	S.E.	β	S.E.
Constant	-3.849***	0.038	-3.625***	0.071	-3.897***	0.031	-3.928***	0.035	-8.478***	0.113
Nature frame	1.822***	0.041							1.731***	0.047
Cause frame			1.109***	0.073					1.587***	0.082
Process frame					2.612***	0.036			2.900***	0.041
Result frame							2.208***	0.039	2.751***	0.044
-2Log-Likelihood	32492.243		34894.953		28578.019		30767.909		21702.895	
DF	1		1		1		1		4	
χ^2	2723.995***		321.286***		6638.220***		4448.329***		13513.343***	
Nagelkerke R Square	0.097		0.012		0.229		0.156		0.444	

Note: *** significant at $p < 0.001$.

5. Conclusions, implications, and limitations

5.1. Conclusions

Based on frames theory and the background of the Thailand drownings, this research explored how online media frame tourism crisis events, and examined the effect of frames on negative travel intentions with public opinion volume data. The moderating and strengthening effects of negative disturbance information (NDI) were investigated as well. The main conclusions were as follows:

First, the online media frame model for the tourism crisis was composed of four dimensions: nature, causes, processes, and results. These four frames had positive and dynamic effects on

negative travel intentions. They were indicative of public concerns, construction, and online communication about the tourism crisis. The public opinion volume generated by them had dynamic characteristics and responses, and caused changes in travel intentions independently and collectively. This indicated that tourism crisis frames are a determinant of travel intentions during a crisis, which is consistent with the results of Kapuściński and Richards (2016) and Xie et al. (2021). In addition, the effect of tourism crisis frames on negative travel intentions had a three-stage dynamic influence process of “rapid increases - slow decline - approaching zero” as a whole, which enriches and expands previous results from public opinion development and dynamic response perspectives. Moreover, the effects and variance contributions of the four crisis frames differed, reflecting dissimilarities in impact levels by type of frame. Based on the 2018 Thailand drowning incident, the response of negative travel intentions to the process was the strongest and was weakest for results. This conclusion is not found in the previous research literature.

Second, NDI strengthened the impact of tourism crisis frames on negative travel intentions. The results suggested that the impulse response trajectory of crisis frames to negative travel intentions was more severe and stronger after the disturbance, and the cumulative variance contribution to negative travel intentions was much higher. Additionally, NDI had a positive and dynamic effect on crisis frames and negative travel intentions. This indicated that the NDI produced by a significant failure in communication promoted the accumulation of crisis information as well as unexpected changes in online public opinion, further aggravating the negative influence of the crisis on destination image and travel intentions. Luo and Zhai (2017) found that significant communication events were a turning point triggering changes in online public opinion and public emotions during tourism crisis communication. Li, Jiang, Mao, and Jiang (2019) argued that significant events were

often accompanied by the rapid accumulation of online crisis public opinion, which readily induced deeper development and widespread diffusion of public opinion, as well as arousing strong and negative emotional and attitudinal responses. This research empirically tested the above research findings, while expanding the previous research results by using volumes of online public opinion.

5.2. Theoretical implications

First, based on frame theory, this research identified online communication frames for tourism crisis events, which provides a theoretical basis for understanding how online media frame crises, and provides fresh insights and directions for crisis communication in tourism. Frame analysis is receiving considerable attention in crisis communication; however, most scholars explore how organizations frame and agenda-set crises through mass media and news media (An & Gower, 2009; Liu & Pennington-Gray, 2015; Kapuściński & Richards, 2016; Ribeiro et al., 2018), overlooking public online communication and the social construction of crisis events. With the development of information communication technologies, the role of publicly-generated crisis frames in shaping public opinion evolution, destination crisis responses, and tourist behavior is more prominent. Crisis framing analysis and public opinion based on online communication are becoming a topic of greater concern (Gerken et al., 2016; Van der Meer et al., 2014). Therefore, this research investigated how online media frame tourism crisis events, and an online crisis communication frame composed of four elements (nature, causes, processes, and results) was proposed. This research advances the use of frame theory in the crisis communication by destinations, extends the portfolio of cases and media situations for crisis frame research, and provides a content-oriented crisis frame model for analyzing public opinion on tourism crises in the online media era.

Second, this research revealed the dynamic response relationship between tourism crisis frames and negative travel intentions based on the volume of public opinion, as well as the effect of NDI, offering empirical evidence for examining the evolution of online public opinion about tourism crises. Although travel intentions during crisis situations is attracting greater attention, there are still obvious disagreements among scholars (Wang & Lopez, 2020). Travel intention responses to crisis communication and crisis frames have been empirically investigated (Kapuściński & Richards, 2016; Xie et al., 2021; Liu-Lastres et al., 2019; Sano & Sano, 2019); however, the research overlooks the dynamic response relationships between them and lacks a public opinion evolution perspective. Based on this “travel intention debate” and the expansion of Kapuściński and Richards’ (2016) and Xie et al.’s (2021) studies, this research confirmed the positive and dynamic effects of tourism crisis frames on negative travel intentions based on public opinion volume data. Combined with the impact of a destination’s failed communications, the moderating and strengthening effects of NDI were identified. Therefore, this research validates and expands the effectiveness of crisis frame effects, and provides a paradigm and theoretical basis for understanding the accumulation of online public opinion and analyzing the dynamic evolution of crisis communication information.

Third, this research expands the methodologies for analyzing the dynamic impacts of tourism crises based on online public opinion volume and frame theory. This has practical value in revealing the public cognitive structure and evolution of online public opinions about tourism crises. Existing online crisis communication research based on public opinions mainly has a focus on the division of different communication stages and their management (Luo & Zhai, 2017; Avraham & Ketter, 2017). The number of online posts and comments were decomposed into four crisis frames as well as converted into public opinion volume data, and the VAR model was adopted to analyze the dynamic

responses and impacts. The empirical results showed that public opinion volume data and the VAR model were appropriate for determining causal and dynamic response relationships among variables.

5.3. Practical implications

First, destination management organizations (DMOs) should be committed to accurate online information reporting and frames constructed about crises. They must meticulously monitor online communications and identify changes and effects of information communication elements, and the crisis frames constructed by an organization should be aligned with the public framing of the crisis. Appropriate measures should be adopted according to the different crisis frames. In addition, the ongoing tracking of key information such as destination image and travel intentions that affect tourist market development is highly desirable. For example, DMOs should establish public opinion warning systems based on online media to monitor the trends in online public opinion as well as intervening in public secondary crisis communication in a timely fashion, thereby minimizing the negative impacts of crises.

Second, DMOs should be aware that the communication and framing on crises is dynamic and evolving. Also, online communication is not a one-way linear process, but a dynamic evolution system with multiple influencers. This process can be disturbed by negative communication incidents producing emotional amplification and polarization, as well as affecting destination image and tourist markets. Thus, adverse communication efforts, such as inaccurate statements, and misleading crisis information that inflame public emotions and attitudes, should be strictly managed and avoided. In addition, the appearance of NDI should be immediately detected and dealt with during online crisis communication, and be rapidly removed.

5.4. Limitations and future research directions

This research has several limitations. First, the public opinion volume data were collected only in Chinese online media. In addition, the data used only reflected the number of comments and posts, and other information, such as poster characteristics, origin regions, and cultural backgrounds due to technical limitations. Future research should validate this conceptual model by collecting data from other countries, as well as expanding the research conclusions by collecting more types of data.

Second, although this research adopted several approaches to ensure coding and labeling validity, manual proofreading has the potential disadvantage of greater subjectivity. Future research should improve the validity of data processing and coding through machine learning, natural language, or confirm the conclusions through other research designs, such as questionnaire surveys, interviews, and experiments.

Third, there may be variations in the structure and effects of information communication frames if the types of tourism crises are different. For example, crises initiated by natural and man-made causes might have different communication effects and orientations. Thus, future research should verify these conclusions through multiple case comparisons.

Finally, due to data and technical limitations, the research only investigated the dynamic impact of tourism crisis frames on negative travel intentions. Future research should explore the relationships among tourism crisis frames as well as their co-occurrence effect by using the VAR model. The outcome variables of tourism crisis frames, such as online convergence behavior, secondary crisis reactions, should be investigated, and the synergistic effects of tourist personal characteristics such as risk tolerance, resilience, and past crisis experiences, should be taken into consideration.

References

- Ajogbeje, K., Adeniyi, O., & Folarin, O. (2017). The effect of terrorism on tourism development in Nigeria: A note. *Tourism Economics*, 23(8), 1673-1678.
- An, S. (2011). Reducing anger and blame: The role of the morality news frame and crisis response strategy. *Public Relations Review*, 37(2), 169-171.
- An, S., & Gower, K. K. (2009). How do the news media frame crises? A content analysis of crisis news coverage. *Public Relations Review*, 35(2), 107-112.
- Avraham, & Eli. (2015). Destination image repair during crisis: Attracting tourism during the Arab spring uprisings. *Tourism Management*, 47, 224-232.
- Avraham, E., & Ketter, E. (2017). Destination marketing during and following crises: combating negative images in Asia. *Journal of Travel & Tourism Marketing*, 34(6), 709-718.
- Ball-Rokeach, S. J. (1985). The origins of individual media-system dependency: A sociological framework. *Communication Research*, 12(4), 485-510.
- Benford, R. D., & Snow, D. A. (2000). Framing processes and social movements: An overview and assessment. *Review of Sociology*, 26(3), 611-639.
- Biran, A., Liu, W., Li, G., & Eichhorn, V. (2014). Consuming post-disaster destinations: The case of Sichuan, China. *Annals of Tourism Research*, 47, 1-17.
- Borah, P. (2011). Conceptual issues in framing theory: A systematic examination of a decade's literature. *Journal of Communication*, 61(2), 246-263.

- Bradbury, S. L. (2013). The impact of security on travelers across the Canada-US border. *Journal of Transport Geography*, 26, 139-146.
- Brown, C. B. (2015). Tourism, crime and risk perception: An examination of broadcast media's framing of negative Aruban sentiment in the Natalee Holloway case and its impact on tourism demand. *Tourism Management Perspectives*, 16, 266-277.
- Bullock, J. A., Haddow, G. D., & Coppola, D. P. (2017). Introduction to emergency management. Butterworth-Heinemann.
- Cahyanto, I., Wiblishauser, M., Pennington-Gray, L., and Schroeder, A. (2016). The dynamics of travel avoidance: The case of Ebola in the US. *Tourism Management Perspectives*, 20, 195-203.
- Chen, Y.C., Shang, R.A., & Li, M.J. (2014). The effects of perceived relevance of travel blogs' content on the behavioral intention to visit a tourist destination. *Computers in Human Behavior*, 30(1), 787-799.
- Cheng, J. W., Mitomo, H., Otsuka, T., & Jeon, S. Y. (2016). Cultivation effects of mass and social media on perceptions and behavioural intentions in post-disaster recovery: The case of the 2011 Great East Japan Earthquake. *Telematics and Informatics*, 33(3), 753-772.
- Cho, S. H., & Gower, K. K. (2006). Framing effect on the public's response to crisis: Human interest frame and crisis type influencing responsibility and blame. *Public Relations Review*, 32(4), 420-422.
- Choi, J., & Lee, S. (2017). Managing a crisis: A framing analysis of press releases dealing with the Fukushima nuclear power station crisis. *Public Relations Review*, 43(5), 1016-1024.

- Claeys, A., & Cauberghe, V. (2014). What makes crisis response strategies work? The impact of crisis involvement and message framing. *Journal of Business Research*, 67(2), 182-189.
- Coombs, W. T. (1999). Information and compassion in crisis responses: A test of their effects. *Journal of Public Relations Research*, 11(2), 125-142.
- Coombs, W. T. (2006). *Crisis management: A communicative approach*. In C. H. Botan & V. Hazleton (Eds.), *Public relations theory* (pp. 171-197). Mahwah, NJ: Lawrence Erlbaum Associates.
- Coombs, W. T. (2007). Protecting organization reputations during a crisis: The development and application of situational crisis communication theory. *Corporate Reputation Review*, 10(3), 163-176.
- Coombs, W. T. (2014). *Ongoing crisis communication: Planning, managing, and responding*. Sage Publications, pp.4.
- Coombs, W. T., & Holladay, S. J. (2004). *Reasoned action in crisis communication: An attribution theory-based approach to crisis management*. In D. P. Millar & R. L. Heath (Eds.), *Responding to crisis communication approach to crisis communication* (pp. 95-115). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Cró, S., & Martins, A. M. (2017). Structural breaks in international tourism demand: Are they caused by crises or disasters? *Tourism Management*, 63, 3-9.
- Der Meer, T. G. (2014). Organizational crisis-denial strategy: The effect of denial on public framing. *Public Relations Review*, 40(3), 537-539.

- Derani, N. E. S., & Naidu, P. (2016). The impact of utilizing social media as a communication platform during a crisis within the oil industry. *Procedia Economics and Finance*, 35, 650-658.
- Entman, R. M. (1993). *Framing: Toward clarification of a fractured paradigm*. *Journal of Communication*, 43(4), 51-58.
- Fink, S. (1986). *Crisis management: Planning for the inevitable*. New York: American Management Association.
- Fearn-Banks, K. (2016). *Crisis communication: A casebook approach*. Lawrence Erlbaum Associates Publishers, Mahwah, NJ.
- Faulkner, B. (2001). Towards a framework for tourism disaster management. *Tourism Management*, 22(2), 135-147.
- Gamson, W. A. (1992). *Talking politics*. New York: Cambridge University Press.
- Gerken, F., Van der Land, S. F., & Der Meer, T. G. (2016). Crisis in the air: An investigation of AirAsia's crisis-response effectiveness based on frame alignment. *Public Relations Review*, 42, 879-892.
- Prayag, G. (2018). Symbiotic relationship or not? Understanding resilience and crisis management in tourism. *Tourism Management Perspectives*, 25, 133-135.
- Goffman, E. (1974). *Frame analysis: An essay on the organization of experience*. Cambridge, MA: Harvard University Press.
- Greussing, E., & Boomgaarden, H. G. (2017). Shifting the refugee narrative? An automated frame analysis of Europe's 2015 refugee crisis. *Journal of Ethnic and Migration Studies*, 43(11),

1749-1774.

Handler, I. (2016). The impact of the Fukushima disaster on Japan's travel image: An exploratory study on Taiwanese travellers. *Journal of Hospitality and Tourism Management*, 27, 12-17.

Hughes, A. L., Palen, L., Sutton, J., Liu, S. B., & Vieweg, S. (2008). "Site-seeing" in disaster: An examination of on-line social convergence. Proceedings of the 5th International ISCRAM Conference. Washington, DC.

Jonas, A., Mansfeld, Y., Paz, S., & Potasman, I. (2011). Determinants of health risk perception among low-risk-taking tourists traveling to developing countries. *Journal of Travel Research*, 50(1), 87-99.

Kapuściński, G., & Richards, B. (2016). News framing effects on destination risk perception. *Tourism Management*, 57, 234-244.

Kim, S. B., & Kim, D. Y. (2014). The effects of message framing and source credibility on green messages in hotels. *Cornell Hospitality Quarterly*, 55(1), 64-75.

Knight, M. G. (1999). Getting past the impasse: Framing as a tool for public relations. *Public Relations Review*, 25(3), 381-398.

Larsen, S., Brun, W., Øgaard, T., & Selstad, L. (2011). Effects of sudden and dramatic events on travel desire and risk judgments. *Scandinavian Journal of Hospitality & Tourism*, 11(3), 268-285.

Lean, H. H., & Smyth, R. (2009). Asian financial crisis, avian flu and terrorist threats: Are shocks to Malaysian tourist arrivals permanent or transitory? *Asia Pacific Journal of Tourism Research*,

14(3), 301-321.

Lee, D. (1997). Frame conflicts and competing construals in family argument. *Journal of Pragmatics*, 27(3), 339-360.

Li, J., Nguyen, T. H. H., & Coca-Stefaniak, J. A. (2020). Coronavirus impacts on post-pandemic planned travel behaviours. *Annals of Tourism Research*, DOI: <https://doi.org/10.1016/j.annals.2020.102964>.

Li, Y., Jiang, G., Mao, T., & Jiang, Z. (2019). The evolution characteristics of tourism opinion crisis based on emotion mining and topic analysis: A case study of the incident of “female tourist attacked in Lijiang”. *Tourism Tribune*, 34(9), 101-113.

Lin, X., Spence, P. R., Sellnow, T. L., & Lachlan, K. A. (2016). Crisis communication, learning and responding: Best practices in social media. *Computers in Human Behavior*, 65, 601-605.

Liu, B., & Pennington-Gray, L. (2015). Bed bugs bite the hospitality industry? A framing analysis of bed bug news coverage. *Tourism Management*, 48, 33-42.

Liu-Lastres, B., Schroeder, A., & Pennington-Gray, L. (2019). Cruise line customers' responses to risk and crisis communication messages: An application of the risk perception attitude framework. *Journal of Travel Research*, 58(5), 849-865.

Liu, Y., & Boin, A. (2020). Framing a mega-disaster: Political rhetoric and the Wenchuan earthquake. *Safety Science*, 125, 1-8.

Luo, Q., & Zhai, X. (2017). “I will never go to Hong Kong again!” How the secondary crisis communication of “Occupy Central” on Weibo shifted to a tourism boycott. *Tourism*

Management, 62, 159-172.

Mizrachi, I., & Fuchs, G. (2016). Should we cancel? An examination of risk handling in travel social media before visiting Ebola-free destinations. *Journal of Hospitality and Tourism Management*, 28, 59-65.

Morris, C., & Rubin, S. (2013). *Backpacking, social media, and crises: A discussion of online social convergence*. In: *Information and Communication Technologies in Tourism 2013*. pp 207-217.

Neuman, W. R., Just, M. R., & Crigler, A. N. (1992). *Common knowledge*. Chicago: University of Chicago Press.

Novelli, M., Burgess, L. G., Jones, A., & Ritchie, B. W. (2018). “No Ebola... still doomed”: The Ebola-induced tourism crisis. *Annals of Tourism Research*, 70, 76-87.

Oliveira, A., & Huertas-Roig, A. (2019). How do destinations use twitter to recover their images after a terrorist attack? *Journal of Destination Marketing & Management*, 12, 46-54.

PATA (Pacific Asia Tourism Association). (2003). *Crisis-It won't happen to us*. Bangkok: PATA.

Pizam A, M. Y. (1996). *Tourism, crime and international security issues*. John Wiley & Son Ltd.

Ribeiro, B., Hartley, S., Nerlich, B., & Jaspal, R. (2018). Media coverage of the Zika crisis in Brazil: The construction of a “war” frame that masked social and gender inequalities. *Social Science & Medicine*, 200, 137-144.

Sandoval, M., & Fuchs, C. (2010). Towards a critical theory of alternative media. *Telematics and Informatics*, 27(2), 141-150.

- Sano, K., & Sano, H. (2019). The effect of different crisis communication channels. *Annals of Tourism Research*, 79, 1-12.
- Scheufele, D. A. (1999). Framing as a theory of media effects. *Journal of Communication*, 49(1), 103-122.
- Schultz, F., Utz, S., & Göritz, A. (2011). Is the medium the message? Perceptions of and reactions to crisis communication via twitter, blogs and traditional media. *Public Relations Review*, 37(1), 20-27.
- Seabra, C., Dolnicar, S., Abrantes, J. L., & Kastenholz, E. (2013). Heterogeneity in risk and safety perceptions of international tourists. *Tourism Management*, 36, 502-510.
- Shah, D. V. (2005). Information and expression in a digital age: Modeling internet effects on civic participation. *Communication Research*, 32(5), 531-565.
- Shih, T. J., Wijaya, R., & Brossard, D. (2008). Media coverage of public health epidemics: Linking framing and issue attention cycle toward an integrated theory of print news coverage of epidemics. *Mass Communication & Society*, 11(2), 141-160.
- Sims, C. A. (1980). Macroeconomics and reality. *Econometrica*, 48(1), 1-48.
- Sparks, B. A., & Browning, V. (2011). The impact of online reviews on hotel booking intentions and perception of trust. *Tourism Management*, 32(6), 1310-1323.
- Sparks, C. (2008). Media systems in transition: Poland, Russia, China. *Chinese Journal of Communication*, 1(1), 7-24.
- Su, L., Stepchenkova, S., & Kirilenko, A. P. (2019). Online public response to a service failure

incident: Implications for crisis communications. *Tourism Management*, 73(8), 1-12.

Supadhiloke, B. (2012). Framing the Sino - US - Thai relations in the post-global economic crisis. *Public Relations Review*, 38(5), 665-675.

Tannen, D. (1993). *What's in a frame? Surface evidence for underlying expectations*. In D. Tannen (Ed.), *Framing in Discourse* (pp. 14-56). New York: Oxford Univ. Press.

Utz, S., Schultz, F., & Glocka, S. (2013). Crisis communication online: How medium, crisis type, and emotions affected public reactions in the Fukushima Daiichi nuclear disaster. *Public Relations Review*, 39(1), 40-46.

Van der Meer, T. G. L. A., & Verhoeven, P. (2013). Public framing organizational crisis situations: Social media versus news media. *Public Relations Review*, 39(3), 229-231.

Van der Meer, T. G. L. A., Verhoeven, P., Beentjes, H., & Vliegthart, R. (2014). When frames align: The interplay between pr, news media, and the public in times of crisis. *Public Relations Review*, 40(5), 751-761.

Xie, C., Zhang, J., Morrison, A. M. & Coca-Stefaniak, J. A. (2021). The effects of risk message frames on post-pandemic travel intentions: The moderation of empathy and perceived waiting time. *Current Issues in Tourism*, DOI:10.1080/13683500.2021.1881052.

Wang, F., & Lopez, C. (2020). Does communicating safety matter? *Annals of Tourism Research*, 80, 1-12.

Wang, J., Liu-Lastres, B., Ritchie, B. W., & Pan, D. (2019). Risk reduction and adventure tourism safety: An extension of the risk perception attitude framework (RPAF). *Tourism Management*,

74, 247-257.

Weiner, B. (1985). An attribution theory of motivation and emotion. *Psychological Review*, 92(4), 548-573.

Wolff, K., & Larsen, S. (2014). Can terrorism make us feel safer? Risk perceptions and worries before and after the July 22nd attacks. *Annals of Tourism Research*, 44, 200-209

Wu, B, Xue, L., Morrison, A. M., & Yeung, X. Y. (2012). Frame analysis on Golden Week policy reform in China. *Annals of Tourism Research*, 39(2), 842-862.

Yousaf, S., & Samreen, N. (2016). Information agents and cultural differences as determinants of country's reputation and its subsequent effects on tourism prospects of a country in sustained crises: The case of Pakistan. *Journal of Vacation Marketing*, 22(4), 365-384.

Zhang, J. (2018). Big data and tourism geographies-an emerging paradigm for future study? *Tourism Geographies*, 20(5), 899-904.

Zhang, M., Zhang, G. Y., Gursoy, D., & Fu, X. (2018). Message framing and regulatory focus effects on destination image formation. *Tourism Management*, 69, 397-407.

Zheng, D., Luo, Q., & Ritchie, B. W. (2020). Afraid to travel after COVID-19? Self-protection, coping and resilience against pandemic 'travel fear'. *Tourism Management*, <https://doi.org/10.1016/j.tourman.2020.104261>.