

To cite this article: Xie, C., Zhang, J., Morrison, A.M. and 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*

The effects of risk message frames on post-pandemic travel intentions: The moderation of empathy and perceived waiting time

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Acknowledgements: Funding

Supported by the National Natural Science Foundation of China (Grant No. 41971182)

Humanities and Social Sciences Foundation of Ministry of Education of China (Grant No. 19YJAZH097)

Declarations of interest: No conflict of interest

Abstract

A gap exists in the research on how online media frame a tourism crisis and its 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) the 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 opinions; and (3) online data of public opinions and the VAR model are appropriate for research about 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 opinions; VAR; Thailand

1. Introduction

Tourism is highly sensitive to safety and security issues (Pizam, 1996), and the occurrence of crisis events seriously harms the performance of local destinations. Recently, continuous crises, such as a series of terrorist attacks in Europe (Mizrachi & Fuchs, 2016), Ebola virus in Africa (Cró & Martins, 2017), have caused reductions in tourist demand, and severely affected the tourism economy (Ajogbeje, Adeniyi, & Folarin, 2017). Particularly in a major crisis context, such as the COVID-19 pandemic, triggered “travel fears” lead to the public’s protective travel behaviours (e.g., travel avoidance, cautious travel) (Zheng, Luo, & Ritchie, 2020). Obviously, the information communicated and framed about tourism crises can have a profound and comprehensive impact on people’s attitudes, emotions, and behaviors, as well as the impressions of and confidence in destinations (Cheng, Mitomo, Otsuka, & Jeon,

2016; Lu, 2018; Möller, Wang, & Nguyen, 2018; Luo & Zhai, 2017). In the online era, the communication and social construction of crisis events have become more critical issues, and social media are playing an influential role in transforming crisis events into serious downturns in tourism. Therefore, it is important to investigate how the online media frame a crisis event, as well as the framing's effect on tourism.

Crisis communication is a basic factor affecting the recovery of tourism markets after crises (Cooper, 2006; Bronner & de Hoog, 2016), and crisis-framing communication serves a critical role in defining crises, identifying responsible actors, shaping public opinion, and minimizing negative impacts (Coombs, 2006; An & Gower, 2009). With the empowerment of Internet technology and social media, the public has gained the chance to speak in defining crisis events in online media (Sano & Sano, 2019; Van der Meer & Verhoeven, 2013), and the resulting secondary crisis communication and crisis frames determine the development of public opinion as well as destination crisis responses (Van der Meer, Verhoeven, Beentjes, & Vliegthart, 2014; Luo & Zhai, 2017). However, within the related field of research in tourism, two key gaps exist. First, how the online media frame crises in tourism lacks a comprehensive identification. The crisis frames and news media portrayal of crises are widely investigated, and the research has an important role for the public and organizations to perceive, evaluate, and mitigate negative impacts (An & Gower, 2009; Der Meer, 2014; Liu & Pennington-Gray, 2015). The existing crisis frame research is primarily based upon traditional mass media, which overlooks the public's role in the framing process, and mainly frame and portray the crises in a top-down and one-to-many approach (Borah, 2011; An, 2011; An & Gower, 2009; Supadhiloke, 2012). However, the global reach, speed, and convenience of online media have gradually tipped the control in favor of the public, 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, Schroeder, & Pennington-Gray, 2019), and the related research has utilized a variety of methods and research designs, such as content analysis, experimental analysis, and questionnaire surveys (An & Gower, 2009; Handler, 2016; Sano & Sano, 2019; Claeys & Cauberghe, 2014; Cheng et al., 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.

The specific research purposes were to: 1) propose a basic crisis frame model for public online communication through theoretical analysis; and 2) explore the dynamic impact relationships among crisis frames and travel intentions based on public

opinion volume data. This research revealed the online media framing of crises and the effect on tourism, which will help guide destination crisis communication management in the online media era.

2. Literature review and hypotheses

2.1. Crisis communication

Crises, especially avoidable ones, are a threat to the reputation, prosperity, and survival of an organization (Utz et al., 2013). Crisis communication is a series of information communication activities to resolve or avoid crises by means of the traditional mass or newer online media (Coombs, 1999; 2006). The communication of crisis information is a key procedure within crisis management (Coombs, 1999), which not only affects the development of crisis events, but also may adversely influence public emotions and attitudes towards the crises and society (Ball-Rokeach, 1985; Cheng et al., 2016).

The rapid development of the Internet and social media has greatly changed the communication patterns on tourism crises and the public's participation in their coverage. Crisis communication has entered a new era combining traditional with online media, and online media have become the main channel for expressions of public opinion. Today, online media play a crucial role in crisis communication (Cheng et al., 2016). They strongly influence not only the spread scale and patterns of crisis information, and the responses of destination crisis management teams, but also impact the public's attitudes, behaviors, and responses (Derani & Naidu, 2016). The traditional mass media such as television and newspapers transmit data in a uni-directional and top-down way, and people are only passive information receivers (Utz et al., 2013; Cheng et al., 2016). However, online media greatly elevate public

participation in crisis events and communication. They provide new opportunities and channels for public participation in the transmission and framing of a crisis (Shah, 2005). Thus, online media, especially social media, have gained more discourse power for public participation in crisis communication, promoting the shift from people as passive agenda receivers to active participants (Lin, Spence, Sellnow, & Lachlan, 2016). In addition, the online opinions in crisis communication have become an “indicator” of the development and management of crisis events, and the resulting “social media storms” may trigger group conflicts and social contradictions (Luo & Zhai, 2017). Schultz, Utz, & Göritz (2011) proposed the concept of secondary crisis communication, that is, the public’s online behavior of commenting on, sharing, and forwarding posts about crisis events. Secondary crisis communication has become a critical factor affecting the development of public opinion related to crisis events. Thus, it is crucial to understand the crisis framing of public secondary communication, which plays an important role in guiding online public opinion and mitigating crisis impact.

2.2. Framing analysis in crisis communication

Framing analysis, first proposed by Goffman (1974), evolved from the idea of a “frame”, and has been employed as a useful method in various disciplines and fields. A frame is a cognitive structure and process model, which enables individuals to “locate, perceive, identify, and label” the information flowing around them (Goffman, 1974). Framing analysis refers to the investigation of how individuals construct social reality, that is, people construct their own understandings of social issues through selecting some aspects of social issues and making them salient (Gamson, 1992; An & Gower, 2009). Framing analysis has the functions of problem definition, causal interpretation, moral evaluation, and/or treatment recommendation

(Entman, 1993). Framing analysis has attracted great attention in many 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 and hospitality studies have employed framing analysis to investigate hotel customers' environmentally-friendly activities (Kim & Kim, 2014), hotel booking intentions (Sparks & Browning, 2011), risk perceptions, destination crisis news coverage (Kapuscinski & Richards, 2016; Liu & Pennington-Gray, 2015), image formation (Zhang, Zhang, Gursoy, & Fu, 2018), and public holiday timing (Wu, Xue, Morrison, & Leung, 2012).

Framing is a powerful and significant mechanism, which can help define and solve problems, and shape public opinions about them (Knight, 1999). In crisis communication, framing analysis can be used for the social construction and framing of a crisis, which provide organizations with beneficial insights into the appropriate crisis response strategies to minimize the damage (Liu & Pennington-Gray, 2015; An & Gower, 2009; Der Meer, 2014). Currently, crisis framing analysis in the communication field can be divided into two aspects: media crisis framing and public crisis framing (Scheufele, 1999). Media crisis framing analysis refers to an organization that selectively enhances the salience of some aspects of a crisis through news coverage and media communication, thereby influencing public perceptions of the crisis. For example, based on the Fukushima nuclear power station crisis, Choi & Lee (2017) explored how TEPCO (Tokyo Electric Power Company) used press releases to restore its reputation by analyzing the frames used in the 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, Kapuscinski and Richard (2016) conducted a framing analysis of tourist risk

perceptions in the context of terrorism and political instability and confirmed that risk perceptions in risk-amplification framing was higher than in risk-attenuating framing. Despite their logical and theoretical distinctiveness, these two framing analyses are intertwined and can influence each other, thereby resulting in opinioned public discourse. For example, Gerken, Der Land, & Der Meer (2016) employed semantic-network analysis to investigate to what extent the framing of AirAsia's (the sender) crisis communication had been aligned with the public framing of a crash (the receiver), and this was a good indicator reflecting the effectiveness of organisational crisis-response strategies.

2.3. Framing a crisis event

Previous researchers have identified a handful of crisis frames constructed by news 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, Hartley, Nerlich, & Jaspal, 2018). According to Coombs (1999; 2006), effective crisis communication requires knowing the nature and causes of crisis events at the first moment. More importantly, emergency responses, safety and security decisions, and subsequent actions must be communicated so as to mitigate or recover from the negative impacts of crisis events. Currently, the types of crisis frame are diverse. For example, An & Gower (2009) identified several different types of frames predominantly used in crisis news coverage: attribution of responsibility, human interest, conflict, morality, and economic. In tourism and hospitality, Liu & Pennington-Gray (2015) analyzed five national newspapers news stories pertinent to the bed bug crisis and identified two dominant frames: attribution frame (episodic and thematic) and health-crisis frame (consequence, seriousness, uncertainty, action, reassurance, new evidence, and conflict).

However, the usage of a specific crisis frame differs by crisis type, as does the level of attribution (An & Gower, 2009). Situational crisis communication theory (SCCT) proposes that the crisis type determines the attribution of responsibility; consequently, resulting in different organizational response strategies, public reactions, and reputation damage (Coombs, 1999; 2006)). Thus, it is necessary to identify a basic crisis frame model to realize the general understanding of the portrayal of crisis events.

Combining frame theory and the existing crisis frames (Table 1), this research proposed that the public framing of a crisis through online media includes four basic frames: nature, cause, process, and result frames. The *nature frame* refers to the set of inherent attributes and core characteristics of a crisis, reflecting the basic facts about the occurrence. Multiple factors, such as frequency, predictability, familiarity, and controllable or uncontrollable features, are all important aspects of the nature of crisis events. The *cause frame* represents the sources or related factors that lead to the crisis, such as natural and man-made causes. 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 in this process. The *result frame* is the consequences, including the injuries and deaths, economic losses, and the catastrophic effects, tangible and intangible.

Table 1. Description of crisis frames and sub-frames

Crisis frame	Category	Crisis type	Country /Region	References
Nature frame	Problem definition	Zika crisis	Brazil	Ribeiro et al. (2018)
	Morality frame	Business crisis	America	An & Gower (2009); An (2011)
	Significance	Wenchuan earthquake	China	Liu & Boin (2020)

Cause frame	Familiar/exotic Controllable/uncontrollable	Terrorism, political instability	UK	Kapuscinski & Richard (2016)
	Criminality frame Securitization frame	Refugee crisis	Europe	Greussing & Boomgaarden (2017)
	Attribution frames	Bed bug crisis; Fukushima nuclear power station crisis	America; Japan	Liu & Pennington-Gray (2015); Choi & Lee (2017); An & Gower (2009)
	Causality and responsibility	Wenchuan earthquake	China	Liu & Boin (2020)
	Background/victimisation frame	Refugee crisis	Europe	Greussing & Boomgaarden (2017)
	Accidental frame	Business crisis	America	Cho & Gower (2006)
	Natural/man-made	Terrorism, political instability	UK	Kapuscinski & Richard (2016)
	Announcement	Fukushima nuclear power station crisis	Japan	Choi & Lee (2017)
	Policy prescription	Wenchuan earthquake	China	Liu & Boin (2020)
	Human interest	Business crisis	America	An & Gower (2009)
	Crisis-denial frame	Max Havelaar crisis	Netherlands	Der Meer (2014)
	Apology frame	Fukushima nuclear power station crisis	Japan	Choi & Lee (2017)
	Process frame	New evidence		
Conflict		Bed bug crisis	America	Liu & Pennington-Gray (2015); An & Gower (2009)
Action and reassurance				Liu & Pennington-Gray (2015)
Settlement frame Humanitarianism frame Reception/distribution frame		Refugee crisis	Europe	Greussing & Boomgaarden (2017)

Result frame	Economic frame	Business crisis	America	An & Gower (2009)
	Consequence	Bed bug crisis; Terrorism, political instability	America; UK	Liu & Pennington-Gray (2015); Kapuscinski & Richard (2016)
	Seriousness	Bed bug crisis	America	Liu & Pennington-Gray (2015)
	Labor market integration frame	Refugee crisis	Europe	Greussing & Boomgaarden (2017)
	Economization frame			
	Catastrophic effects	Terrorism, political instability	UK	Kapuscinski & Richard (2016)
	Negative/negative effect			

2.4. Effects of crisis frames on travel intentions

Travel intentions reflect the willingness and desires of tourists to visit destinations, which reflect not only basic desires and general intentions to travel (Larsen, Brun, øgaard, & Selstad, 2011), but also intentions to visit specific destinations (Chen, Shang, & Li, 2014). The relationship between crisis events and travel intentions has received significant scholarly attention. Obviously, it is a complicated process from crisis events to the fluctuation to tourist market in destinations, which is cumulative results of individual travel intention decision of larges number of tourists.

Most researchers have found that crisis events reduce travel intentions (Sano & Sano, 2019; Liu-Lastres et al., 2019). The more severe the consequences of the crisis, the lower are travel intentions, and the slower is the recovery of tourism demand (Jonas, Mansfeld, Paz, & Potasman, 2011). The volume of public opinion in online posting, discussions, and communications, reflects the attitudes, emotions, and future travel intentions of potential tourists. For example, Luo and Zhai (2017) proposed that the public's secondary crisis communication on social media can affect attitudes,

emotions, and travel intentions. Brown (2015) confirmed that the public opinion crisis triggered by a murder had a negative impact on the inbound tourism demand for Aruba, and argued that long-term media storms formed by tourism crisis events would raise doubts about destinations' ability to protect tourists, which in turn would prevent potential tourists from visiting due to safety concerns. The information related to the nature, causes, processes, and results are the four basic frames of communicated online about crisis events. The attention, discussion, and communication of these frames affect the public opinion volume. These four frames are often given negative labels. Thus, the greater the public opinion volume on these 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 of online communication have a strengthening effect on tourists' negative travel intentions

In crisis communication, disturbance information are a general item used to refer to various internal and external information and messages elements that cause undesirable or unexpected changes in crisis public opinion during crisis communication. The crisis lifecycle proposed by Fink (1986) believes that crisis itself and its management and communication is a dynamic, evolution, and chained processes, which will successively experience four stages: prodromal, acute, chronic, and resolution. Thus, negative disturbance information (NDI) refers to the internal and external information elements that cause the tourism crisis public opinion to deviate from the original expected evolution process, and it easily triggers the rapid accumulation of public opinion in a short period of time, leading to a secondary crisis of public opinion. Generally, significant news reports and adverse communication efforts of destination are easily become negative disturbing information that affects

public opinion on 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 from the perspectives of crisis communication and image restoration.

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). “Horror stories” reported by the media may trigger negative destination images (Bradbury, 2013) and travel intentions (Brown, 2015) in a dynamic communication process. Thus, significant news reports become disturbing information that affects the volume and tenor of public opinion about crisis frames. Moreover, adverse communication efforts, such as over-revealed crisis information, inaccurate or misleading statements in the light of facts, and failed crisis management and responses, may negatively influence tourism crisis public opinion (Lean & Smyth, 2009). Negative emotions are easily stimulated by adverse information and inappropriate actions, which can elevate the volume of public expression about crisis frames and raise negative travel intentions. Therefore, Hypothesis 2 was proposed as:

Hypothesis 2: Negative disturbance information has a strengthening effect on the crisis frames of crisis communication (H2a) and negative travel intentions (H2b)

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

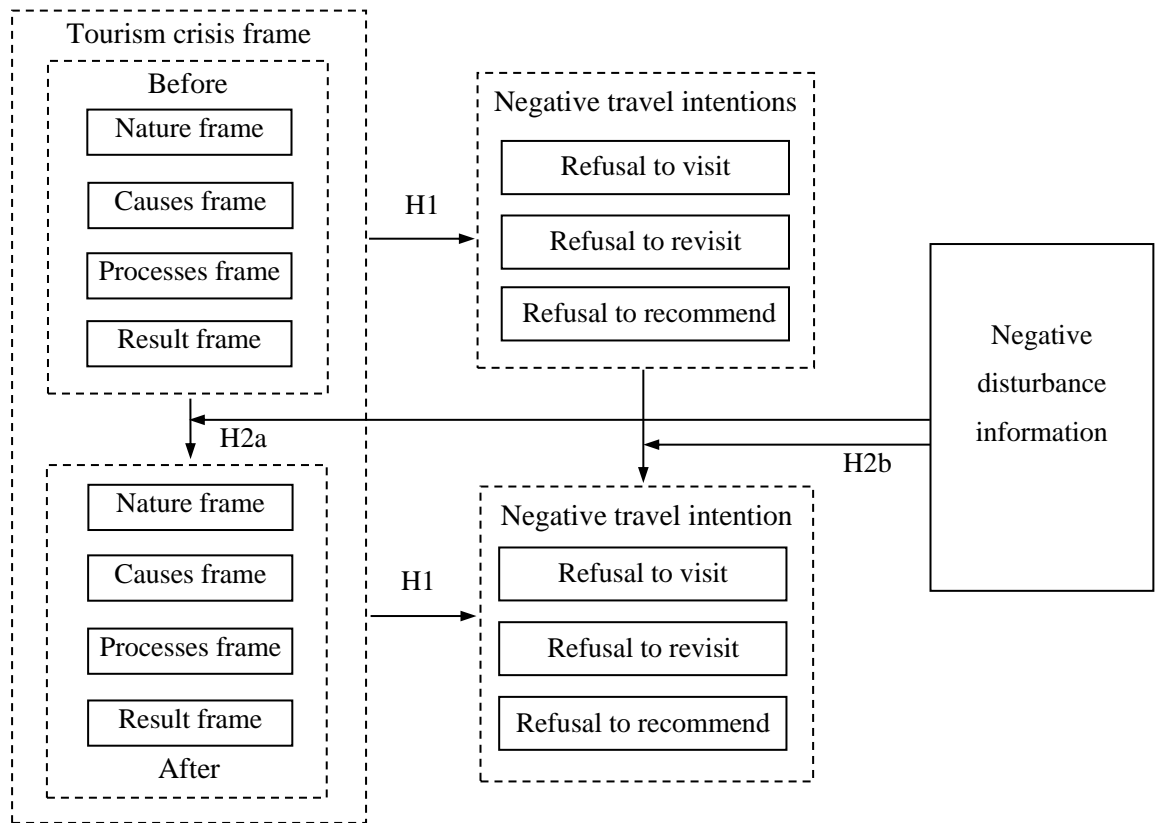


Fig. 1. Conceptual model

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. The accident involved several factors, including bad weather, lack of warning, ship safety, and the failure of captains. News of the accident was widely spread in online platforms or communities within China because many Chinese tourists were injured or 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 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 boating 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 descended.

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, comparing, and removing duplications, 112,313 comments and posts were retained and formed the original database on the Thailand cruise boat drownings. As mentioned, the crisis frames for public online communication consists of four dimensions: nature, causes, processes, and results. 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. Negative disturbance information was measured by the questionable statements of senior Thai officials. According the relevant crisis framing research, variables were tagged and measured based on the keyword attributes of the original database (Wu et al., 2012; Liu & Pennington-Gray, 2015). Content analysis was used to identify keywords. Three Ph.D. students in the field of 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 2).

Table 2. 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

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). The volume of public opinion was counted in units of hours, and finally formed time-series data for each variable. For example, the amount of data related to crisis nature was X1 at 0 o'clock on July 5, and the public opinion volume on the nature frame of this crisis in this period was X1. Time-series data on crisis frames, negative disturbance information, and negative travel intentions were collected from 00.00 on 5 July to 23:59 on 15 July 2018.

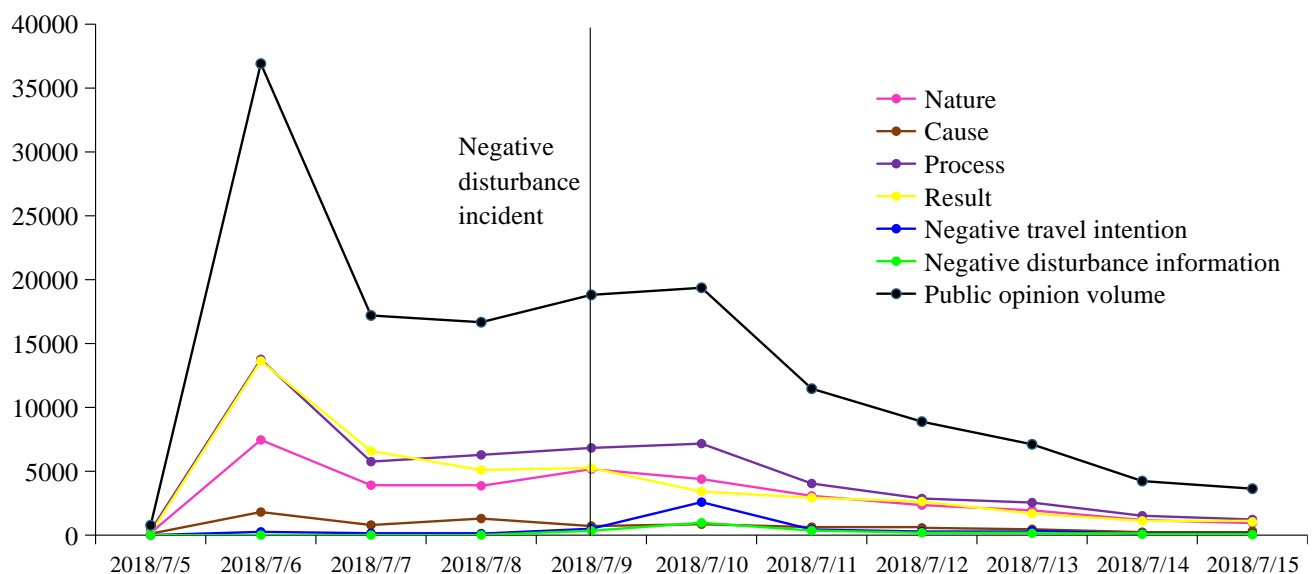


Fig. 2. Descriptive statistic of public opinion volume

3.2.3. Data analysis

Public opinion can change with time and there may be relationships and interactions among variables, including negative travel intentions (NTI), negative disturbance information (NDI), and crisis frames (NCPR). In other words, the public opinion volume generated in a prior stage may affect the volume in the next 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, NTI, and NDI. VAR is a type of non-structural equation model that applies the prediction of 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:

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

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 should be performed. Therefore, 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 (NCPR), NTI, 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.

4. Results

4.1. Stationarity test of time-series data

Unit-root test were used to examine the stationarity of 16 data series (Table 3). The ADF test results indicated that all sequences of the variables in the sample and the sample after the negative disturbance incident were stationary at the 1% significance level. In the sample before the negative disturbance incident, the variable sequences of C and NTI were stationary in order 0, namely I(0)., and the variable sequences of N, P, and R were stationary in order 1, namely I(1).. Thus, the results are consistent with the premises of the Granger causality test and VAR model.

Table 3. 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

DI 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 NTI

4.2.1. Granger causality test

This research proposed a VAR model composed of four crisis frames (NCPR) and NTI, and an optimal lag period of 1, namely VAR_a(1). The results of the Granger causality test showed that the four frames (NCPR) caused independent and collective changes in NTI (Table 4). This means a change in public opinion about NCPR contributed to changes in travel intentions. These results justified the rationale and validity for constructing VAR_a(1).

Table 4. 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
		Prob.	-	-	-	-	-	0.0000

4.2.2. Impulse response function between NCPR and NTI

The dynamic response process between the four crisis frames (NCPR) and NTI, 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.

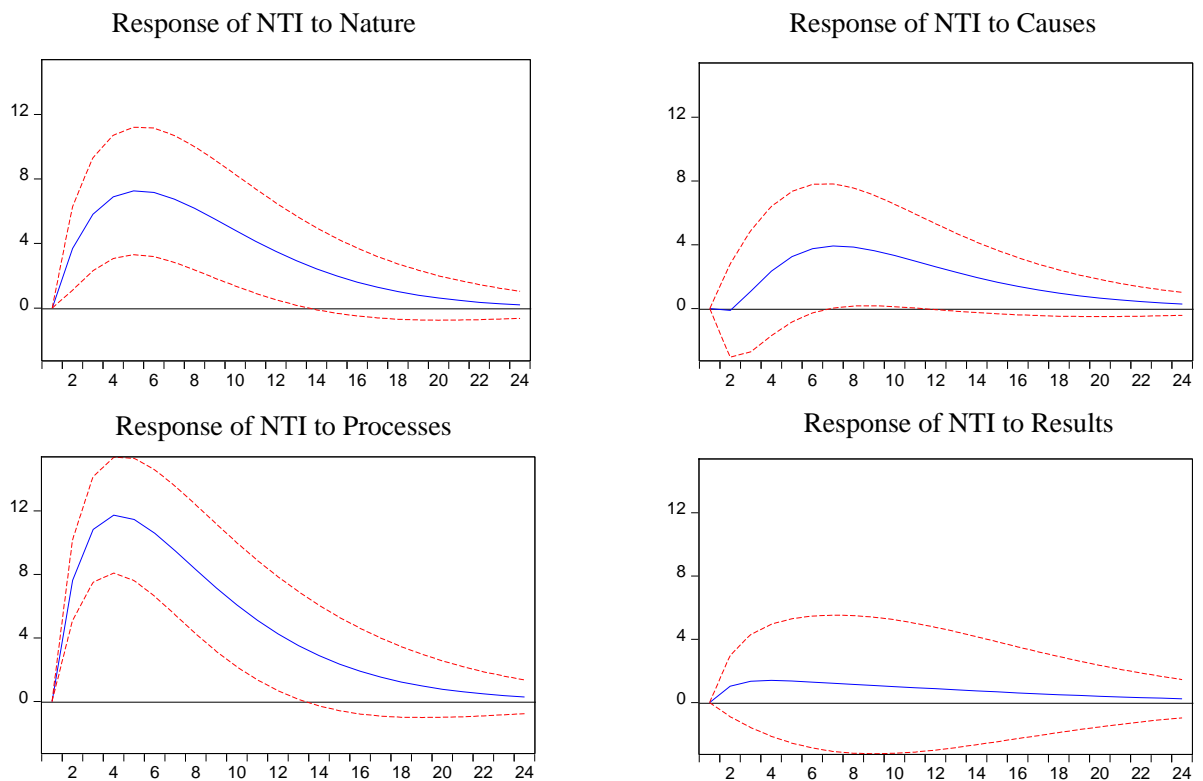


Fig. 3. Impulse response function of VAR_a(1)

The solid NCPR line indicates the dynamic response process of NTI under the impact of NCPR. By giving a positive standard deviation shock to the N, NTI rose

rapidly and reached its peak value in the fifth lag stage, and then quickly declined to zero. Doing likewise with C, NTI exhibited three stages of steady, rapid increases, and then a slow decline, and attained its peak value in the fifth lag stage. The dynamic response of NTI to P was consistent with N; and the response of NTI to R indicated stable upward and downward trends. The dynamic responses of NTI to NCPR were all positive and decreased to zero eventually. In addition, the response of NTI to P was the strongest, followed by N. The responses of NTI to R and C were weak, the NTI was affected slightly only in the early stages.

4.2.3. Variance decomposition of NTI

The Cholesky variance decomposition method was applied on the dynamic relationship between NCPR and NTI, and the periods set to 24 hours. P contributed the highest NTI 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 5). The variance contribution of N to NTI ranked second and remained at 13.8% in the 24th period. Both C and R had lower variance contributions to NTI, and C accounted for 4.2% and R for 0.65%. Therefore, the crisis frames (NCPR) had a dynamic impact on negative intentions, supporting H1.

Table 5. 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
DI			17.8791	22.7067	25.5666	26.4114	26.6533	26.7159
			8.0607	28.4664	24.8383	24.6195	24.8418	24.9220
			10.5336	22.0077	20.2319	20.8259	21.5186	21.7075

4.3 Dynamic response process of crisis frames (before) to NDI

The effect of negative disturbance information on the dynamic relationship between NCPR and negative travel intentions was analyzed. The whole sample was separated into two sub-samples based on the occurrence time of the negative disturbance incident (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 negative disturbance information (NDI) on NTI was also explored. A VAR_b(3) model was developed to present the dynamic response relationship between NCPR and NTI based upon the sub-sample before the negative disturbance incident. The results of the Granger causality test indicated that NCPR collectively caused changes in NTI ($\chi^2 = 29.96$, $p = 0.003$), 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, NTI 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. P

contributed the highest NTI variance and remained at around 16% in the sixth period; C accounted for the lowest NTI variance and remained at around 3% in the fourth period.

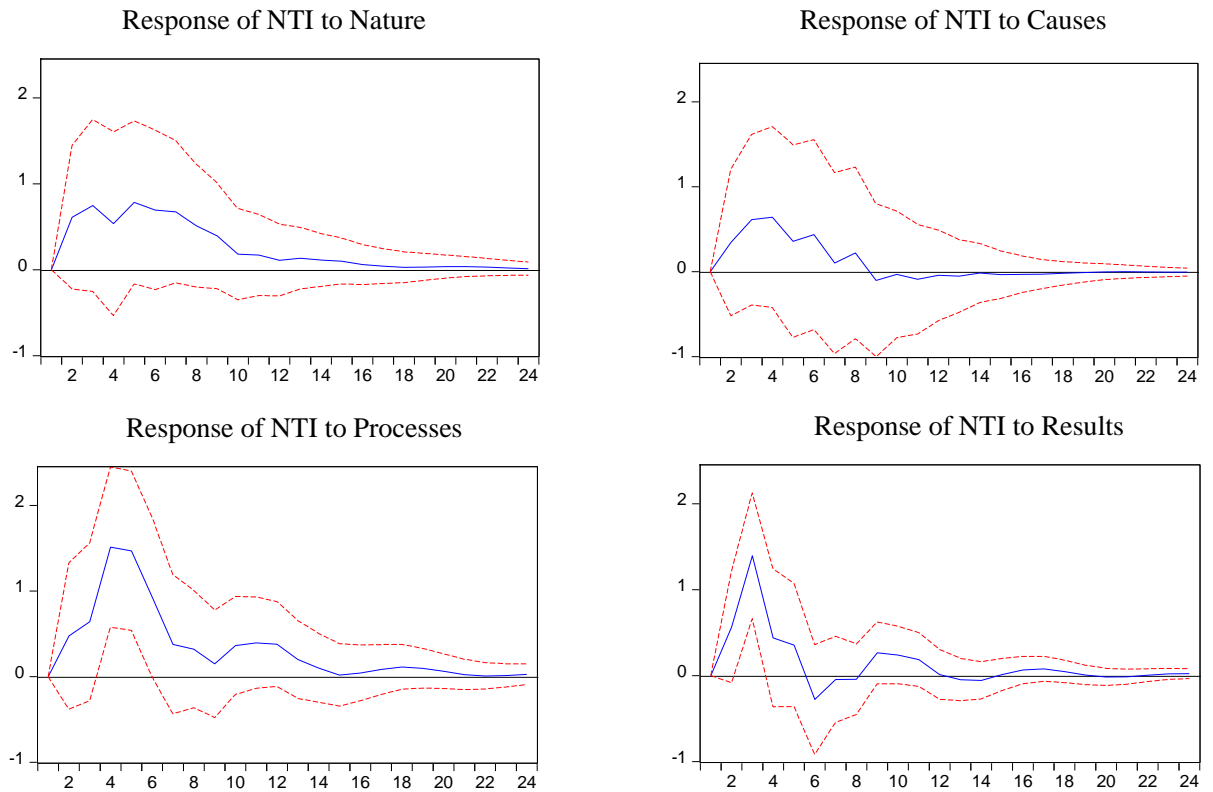


Fig. 4. Impulse response function of $VAR_b(3)$

4.4. Dynamic response process of crisis frames (after) to NDI

The Granger causality test indicated the NCPR caused changes in NTI ($\chi^2 = 156.16$, $p = 0.000$). The dynamic response functions after the NDI between NCPR and NTI are shown in Figure 5, and they were all above the horizontal axis. When the four frames were given positive standard deviation shocks, NTI rose and rapidly reached its peak value, and then gradually dropped to zero. P contributed the highest NTI variance and remained at around 47% in the eleventh period. N accounted for the lowest NTI variance and was at around 3.7% finally. Thus, the impulse response functions of NCPR to NTI were more severe and stronger after the NDI, and the

cumulative variance contribution to NTI (71.34%) was also much higher than before (35%).

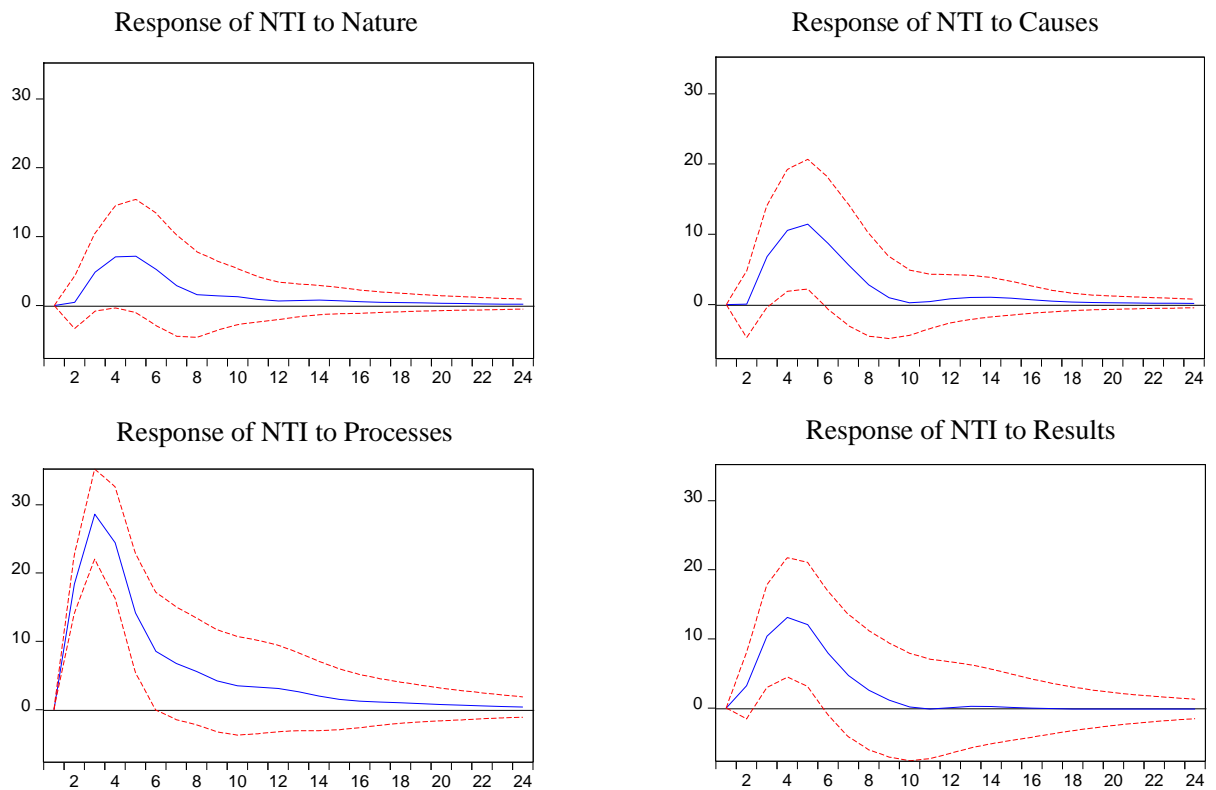


Fig. 5. Impulse response function of VAR_c(3)

4.5. Dynamic enhanced impact of NDI

Five VAR (VAR_{d-g}) models were developed to examine the dynamic impacts on travel intentions and NCPR produced by NDI based on the sub-sample after the NDI.

As shown in Table 4, NDI caused changes in NTI ($\chi^2 = 39.66$, $p = 0.00$), N ($\chi^2 = 12.38$, $p = 0.00$), C ($\chi^2 = 8.899$, $p = 0.03$), P ($\chi^2 = 44.38$, $p = 0.00$), and R ($\chi^2 =$

31.49, $p = 0.00$). VAR_d(3), VAR_e(2), VAR_f(3), VAR_g(5) and 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, NTI rose rapidly and reached its 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 C was high, at 17.9% in the first period, and stayed above 26% after the 12th period. The variance contribution of NDI to N and P both remained at around 24% in the 24th period; and the variance contribution of NDI to R fell between 7.9% and 21.7%. Thus, NDI had a dynamic impact on NCPR and NTI, among which the enhanced impact on NTI and C was high. Therefore, H2 was supported.

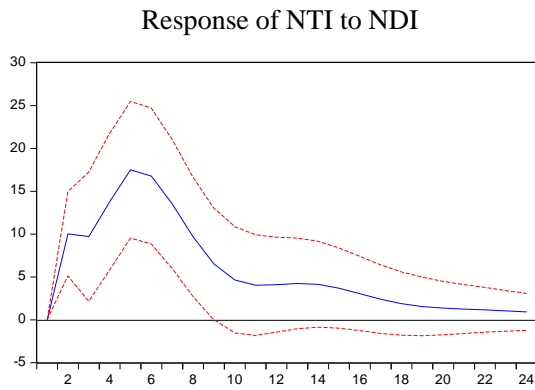


Fig. 6a. VAR_d(3) - NTI

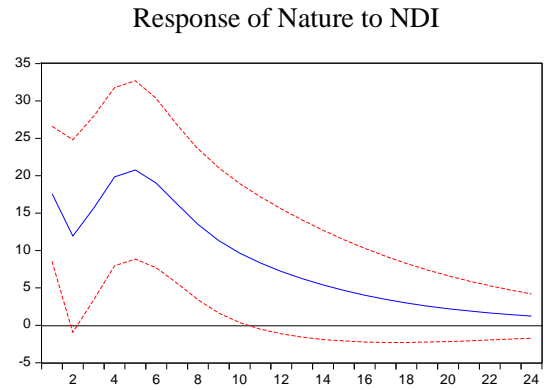


Fig. 6b. VAR_e(2) - Nature

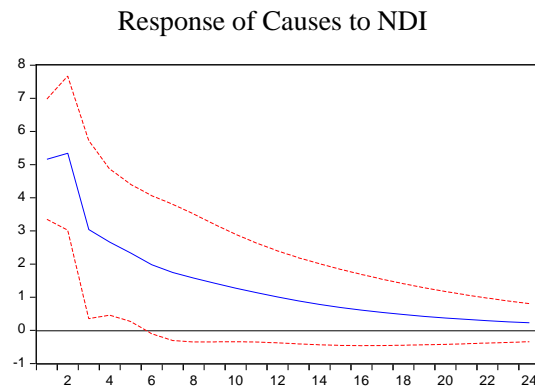


Fig. 6c. VAR_f(3) - Cause

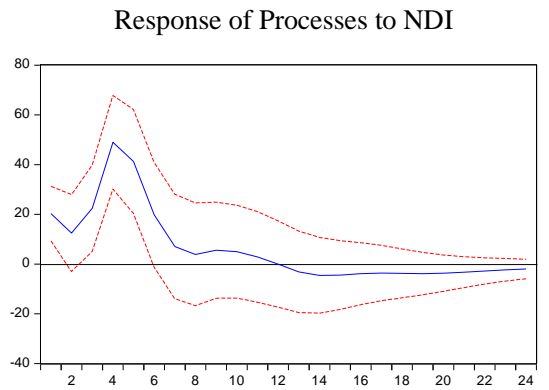


Fig. 6d. VAR_g(5) - Process

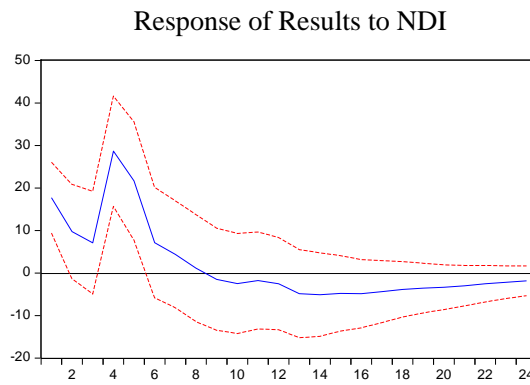


Fig. 6e. VAR_h(5) - Result

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, which shows how a binary response is dependent on a set of explanatory 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 NTI happened, and $Y_k = 0$ if not. The probability (p) that NTI happened was formulated as follows:

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

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 6. Model 1 is the logistic regression model of N and NTI, which was significant [$\chi^2 (df = 1) = 2723.995, p < 0.00$], and indicated that N had a positive impact on NTI ($\beta = 1.822, p < 0.00$). Model 2, the logistic regression model of C and NTI, was significant [$\chi^2 (df = 1) = 3291.2, p < 0.00$], and showed that C had a positive impact on NTI ($\beta = 1.11, p < 0.00$). Model 3, the logistic regression model of P and NTI, was significant [$\chi^2 (df = 1) = 6638.22, p < 0.00$], with P having a positive impact on NTI ($\beta = 2.61, p < 0.00$). Model 4, the logistic regression model of R and NTI, was significant [$\chi^2 (df = 1) = 4448.33, p < 0.00$], with R having a positive impact on NTI ($\beta = 2.21, p < 0.00$). Model 5, the logistic regression model of the four frames (NCPR) and NTI, 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 6. 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. Conclusion, implications, and limitations

5.1. Conclusion

The online media frame model for the tourism crisis was composed of four dimensions: nature, causes, processes, and results. These four frames are indicative of the public's concerns about the online communication of tourism crises. The results showed that these frames had a significant communication effect, and the volume of public opinion generated by them had dynamic characteristics and responses.

The crisis frames had dynamic impacts on negative travel intentions. The four frames independently and collectively caused changes in travel intentions. The effects and variance contributions differed, reflecting differences in impact levels by type of crisis frames. Based on the 2018 Thailand drowning incident, the response of negative

travel intentions to the process was the strongest and was weakest for results.

Negative disturbance information had dynamic and strengthening effects on crisis frames and negative travel intentions. The impulse response trajectory of crisis frames to negative travel intentions was more severe and stronger after disturbance, and the cumulative variance contribution to travel intentions was much higher. The negative disturbance information produced was an important catalytic factor promoting the accumulation of crisis information and increasing the volume of online public opinion.

5.2. Theoretical implications

This research provides new insight and direction for crisis communication in tourism. The occurrence of crises and their social construction are receiving greater attention, and multiple crisis frames have been identified based on specific crisis situations (An & Gower, 2009; Liu & Pennington-Gray, 2015). Based upon previous research findings, this investigation proposed and tested the communication frames of tourism crises, potentially providing a theoretical basis for general understanding of the crisis frame structure of online communication. Thus, this research extends the application of frame analysis in destination crisis communication, as well as provides a content-oriented crisis frame model for analyzing public opinion on tourism crises in the online media era.

This work clarifies the development and response mechanisms of online crisis communication from a framing analysis perspective, offering a theoretical basis for examining the evolution of online public opinion about tourism crises. This research decomposed the crisis communication frames and confirmed their dynamic impacts. In addition, the impact of negative disturbance information was considered. Overall, a

paradigm and theoretical basis are presented for understanding the accumulation of online public opinion and analyzing the dynamic evolution of crisis communication information.

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. 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 responses and impacts. The empirical results showed that these frames, data, and the VAR model were appropriate for determining causal relationships among variables.

5.3. Practical implications

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 to minimize the negative impact of public opinion. The ongoing tracking of destination image and travel intentions is also highly desirable. Second, DMOs should be aware that the communication and framing on crises is dynamic. Also, online communication is not a one-way linear process, but a dynamic evolution system with multiple influencers. This process can be disturbed by inaccurate reporting producing emotional amplification and polarization.

5.4. Limitations and future research directions

The public opinion volume data used only reflected the number of comments and posts, and future research should collect other information, such as poster characteristics, origin regions, and cultural backgrounds. Second, there may be variations in the structure and effect 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 personal traits of tourists were not taken into consideration. Future research should explore the effects of characteristics such as risk tolerance, travel frequency, and past crisis experiences on online crisis communication.

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.
- 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.
- Bronner, F., & de Hoog, R. (2016). Crisis Resistance of Tourist Demand: The Importance of Quality of Life. *Journal of Travel Research*, 55(2), 190-204.
- 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.
- 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.
- Cooper, M. (2006). Japanese tourism and the SARS epidemic of 2003. *Journal of Travel & Tourism Marketing*, 19(2-3), 117-131.
- 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.
- Gamson, W. A. (1992). *Talking politics*. New York: Cambridge University Press.
- Gerken, F., 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.
- 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.
- 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.
- Kapuscinski, 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-

- 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.
- 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.
- Lu, C. L., Chen, S. T., & Kuo, H. I. (2018). International tourism demand in Asia:

- before and after the economic crisis. *Asia Pacific Journal of Tourism Research*, 23(11), 1073-1085.
- 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.
- Möller, C., Wang, J., & Nguyen, H. T. (2018). #Strongerthanwinston: Tourism and crisis communication through Facebook following tropical cyclones in Fiji. *Tourism Management*, 69, 272-284.
- 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.
- 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.

- 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.
- Shah, D. V. (2005). Information and expression in a digital age: modeling internet effects on civic participation. *Communication Research, 32*(5), 531-565.
- 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.
- 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.
- 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](https://doi.org/10.1016/j.tourman.2020.104261).