

**Destination risk perception, image and satisfaction: The moderating
effects of public opinion climate of risk**

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Abstract

There is scant knowledge about how public opinion climate of risk influences tourist behavior in times of a safety crisis at the destination. In this study, we examined the potential moderation effect of public opinion climate on the relationships between tourist risk perception, destination image, and tourist satisfaction. We further distinguished tourist pre-travel and post-travel risk perceptions and proposed a path model linking pre-travel risk's effect on tourist satisfaction with post-travel risk perception and destination image as the serial multiple mediators. Data were collected from an on-site survey of tourists who visited China's Xinjiang area. The results indicate public opinion climate has a significant moderation effect above and beyond the effects of both pre-travel and post-travel risk perceptions on destination image and tourist satisfaction.

Keywords: Tourist risk perception; public opinion climate; social environment; tourist satisfaction; destination image.

1. Introduction

Tourism is an industry that is vulnerable to various risks, from natural disasters, the outbreak of diseases to terrorist attacks (Fuchs & Reichel, 2011; Quintal, Lee, & Soutar, 2010). These risks pose serious challenges to destinations that encounter risk events (Lepp, Gibson, & Lane, 2011). Risk perception of a destination is believed to have a negative impact on their evaluation and subsequently their satisfaction with visiting the destination (Chang, 2010; Li et al., 2016; Quintal et al., 2010; Yüksel & Yüksel, 2007). However, not all studies support this. For instance, Sohn, Lee, and Yoon (2016) found that the risk perception had a negative impact on destination evaluation, but had no direct impact on satisfaction (Sohn et al., 2016). The study by Filep et al. (2014) showed that there was no direct relationship between risk perception and satisfaction. Lo (2012) found that tourist risk perception did not have an impact on either satisfaction or behavioral intentions. The lack of consistent findings in the previous studies indicates that there is a need for research that investigates the possible intervening variables between risk perception and tourism satisfaction. It is possible that the contrasting findings might be due to the pre- and post-travel situation. Previous studies show that tourist post-travel perceptions of the destination are more positive than their pre-travel ones (González-Rodríguez, 2016; Jani & Hwang, 2011; Papadimitriou & Gibson, 2008). Moreover, according to Larsen, Brun, and Øgaard (2009), potential tourists tend to worry more than the tourists at the destination. Therefore, an individual's risk perception may vary before and after they travel to the destination.

Before visiting a destination, a tourist's risk perception is mainly based on information flows in their social environment (Renn et al., 1992), which includes multiple sources from mass media to social interactions (Brenkert-Smith et al., 2013;

Covello & Sandman, 2001). When tourists are visiting the destination, their perception of risk is then shaped by their direct experiences, in addition to their interaction with others as well as information from the media in the social environment (Kuhar et al., 2009). Therefore, it is necessary to distinguish tourist pre-travel perception from post-travel perception to gain greater insights into their interconnection and impacts on tourist destination image and satisfaction.

The contrasting findings regarding the relationship between risk perception and tourist satisfaction may also be due to previous studies neglecting the social environment of risk perception. According to the Social Amplification of Risk Framework (Kasperson et al., 1988), risk is communicated through various information outlets, such as institutions, media, social groups and the individual, all of them could serve as "amplification stations" to intensify the social perception of risk (Binder et al., 2011). On the other hand, the spiral of silence theory of public opinion (Noelle-Neumann, 1974) indicates that people tend to voice those opinions held by the majority, and withhold those perceived to be held by a minority, as a result, majority opinions become the prevalent views while minority views were not heard and become silenced. Applying public opinion theory to the context of the risk communication process, we could reason that risks perceived by a majority of the public tend to be "amplified", while those perceived by a minority of public could be "attenuated" or "silenced". Hence the public opinion climate of risk might not accurately reflect the true risk. However, surrounded by the social environment, an individual's risk perception is therefore shaped by both the "objective" or actual risk and the social experience of the risk. Similar to the social norm, the public opinion climate of risk serves as an important cue influencing individual risk perception and behaviors (Cialdini, Kallgren, & Reno, 1991; Kusumi, Hirayama, & Kashima, 2017).

This study, therefore, attempts to develop and test a conceptual model assessing the impacts of tourist pre-travel and post-travel risk perception on destination image and satisfaction, with public opinion climate as a moderating factor. China's Xinjiang area was selected for the empirical study. The rationale was that as a popular tourist destination, the area is also known for several terrorist attacks and political conflicts in recent years (Du & Dan, 2015). Participants were recruited at six major tourist attraction sites. The data results verify the predictions hypothesized in our model.

2. Conceptual background and hypothesis development

2.1. Tourist risk perception and destination image

Perceived risk is subjective and varies across different individuals (Adam, 2015; Reisinger & Mavondo, 2005). Perception of risk is influenced by individual's judgments on the probability of risk events as well as their social and cultural contexts (Binder et al., 2011; Kusumi et al., 2017), and influences consumption decisions, behavior and satisfaction (Yüksel & Yüksel, 2007).

Tourists may have different risk perception judgments before, during and after their visit, because tourists' perception of risk evolves as they gain direct experience of the destination (Jonas & Mansfeld, 2017). Pre-travel risk perception is largely based on secondary information, including that from mass media, social media, as well as interpersonal word-of-mouth (Chen et al., 2016). **Larsen et al. (2009) found that potential tourists showed greater concerns about the risks in the destination than tourists who have visited the destination.** Fuchs and Reichel (2011) showed the differences in risk perception between first-time versus repeat visitors. In their study, first-time visitors are considered at the 'post-travel' stage and are experiencing the destination, whereas repeat visitors are those who have experience of the destination. Most of the studies on risk perception focus on the pre-travel stage (e.g. Kozak, Crofts, & Law, 2007; Reisinger & Mavondo, 2005; Sönmez & Graefe, 1998; Williams & Baláž, 2013; Wong & Yeh, 2009).

Destination image is defined as the sum of impressions or beliefs that one has of a destination (Kotler, Haider, & Rein, 1993; Styliadis, Shani, & Belhassen, 2017). Similar to risk perception, destination image also evolves through the different stages of visitation experiences, from initial organic image (before planning from travel),

induced image (travel preparation) and realistic image (with visit experience)(Becken et al., 2017; Fakeye & Crompton, 1991).

Incidents of safety hazards, such as terrorism and political instability, natural disasters, disease, crimes can damage a destination's image (Lehto, Douglas, & Park, 2008). Examining the case of Brunei, Chen, Chen, and Okumus (2013) further indicated that unfamiliar culture could negatively affect destination image. Chew and Jahari (2014) investigated the case post-disaster Japan and showed that socio-psychological risk and financial risk had negative effects on destination image, while the impact of the third dimension, the physical risk was not significant. A recent study of China by Becken et al. (2017) suggested that urban air pollution risk had a negative influence on the destination image. Thus:

H1a: Pre-travel risk perception is negatively related to destination image.

Post-travel risk perception involves a tourist's direct experience with the destination. As argued by Gartner (1994), when tourists are in the destination, the direct experience becomes the dominant factor in the formation of destination images. Jani and Hwang (2011) suggested that pre-travel images pertain to cognitive and functional information, while post-travel images are based on tourists' psychological or affective feelings about their experience of the destination. Papadimitriou and Gibson (2008) found that tourist post-travel images of Greece were more positive to their pre-travel images of Greece. Similar to risk perception, pre-travel destination image perceptions are primarily based on secondary information, while during and post-travel image perceptions emanates from personal experience at the destination. A positive experience at the destination reduces risk and improves image perceptions (Jani & Hwang, 2011; Papadimitriou & Gibson, 2008). Hence, we hypothesize:

H1b: Post-travel risk perception is negatively related to destination image.

2.2. Tourist risk perception and tourist satisfaction

Tourism satisfaction is the result of a tourist's experience of comparing his expectations and experiences of the destination (Pizam, Neumann, & Reichel, 1978). Tourists are satisfied when their experience of the destination is higher than expected (Chon & Olsen, 1991). Pre-travel expectation and visit experiences are the two important factors influencing satisfaction (Biodun, Haji-Din, & Abdullateef, 2013). Yüksel and Yüksel (2007) found that risks experienced by tourists had a significant negative impact on satisfaction. Chang (2010) showed that tourism risk of different dimensions had a significant impact on satisfaction. Several other studies also show that risk has a significant negative impact on customer satisfaction (Cheng & Lee, 2011; Ghotbabadi, Feiz, & Baharun, 2016; Li et al., 2016). Thus,

H2: Both pre-travel risk perception (H2a) and post-travel risk perception (H2b) have significant negative effects on satisfaction

2.3. Mediating effects of post-travel risk perception and destination image

Prior research confirms that tourist's visitation experience has a direct impact on the formation of the destination image (Tasci & Gartner, 2007). Post-travel risk perception is part of the tourist's experience of the destination can have a direct impact on destination image. As the tourist gains more experience of the destination, pre-travel perception evolves to become post-travel risk perception evolves, suggesting that pre-travel perception influences destination image through post-travel risk perception.

Previous studies also reveal that destination image has a positive effect on satisfaction (Bui & Le, 2016; Coban, 2012; Mohammed et al., 2014). Given our

previous hypothesis of post-travel risk perception's effect on destination image, this then indicates that destination image serves a mediator between post-travel risk perception and satisfaction. Linking the above relationships together, we posit that:

H3: The relationship between pre-travel risk perception and satisfaction is mediated through post-travel risk perception and destination image.

2.4. The moderating role of the public opinion climate

Previous studies on risk perceptions in tourism have explored the variety of risks related to tourism (e.g. Fuchs & Reichel, 2011; Reisinger & Mavondo, 2005; Richter, 2003; Roehl & Fesenmaier, 1992; Sönmez & Graefe, 1998), and factors influencing tourist risk perception, such as psychographic variables, motivation, cultural or religious background, and nationality (e.g. Carr, 2001; Lepp & Gibson, 2003; Reisinger & Mavondo, 2005; Seddighi, Nuttall, & Theocharous, 2001). However, the tourism literature has been limited to the conceptualization of risk perception from consumer decision-making perspective (Adam, 2015; Dowling & Staelin, 1994; Mitchell, 1999; Quintal et al., 2010), neglecting the wider literature of risk analysis that embraces a diverse range of perspectives in psychology, sociology, cultural theories and many others. Particularly, the social environment of risk information and the dynamics of public opinion about risk (Jonas & Mansfeld, 2017; Moussaïd, 2013) have rarely been considered in the previous tourism risk studies.

It is well recognized in the risk analysis literature that the social environment could amplify or attenuate certain risk information, with some distorted while other stifled (Binder et al., 2011; Kasperson et al., 1988; Kusumi et al., 2017). Social Amplification of Risk Framework (Kasperson et al., 1988) emphasizes the process of interactions among social groups, which shapes public perceptions of risk and social

responses to the risk. The framework suggests that individuals are one of the “amplification stations” transmitting risk information, often small and biased, along with “amplification stations” such as institutions, mass media and social media (Binder et al., 2011). Given today's proliferation of information outlets, individuals often need to judge a large amount of different or even conflicting information to form their own opinion (e.g. risk perception). As individuals interact with other individuals, their opinions influence and are influenced by others' opinions. This interpersonal risk communication process leads to collective opinion formation in complex patterns such as consensus, polarization, and clustering (Moussaïd, 2013).

Individuals constantly monitor their social environment to assess the ‘climate’ of public opinion (Noelle-Neumann, 1977). Given that risk information is either amplified or attenuated in the social communication process (Binder et al., 2011; Kasperson et al., 1988; Kusumi et al., 2017), public opinion of risk level of a destination may not truly reflect the objective risk level, and could be incongruent with individual’s risk perception that is based on first-hand experience of the destination. However, public opinion climate is akin to a descriptive social norm that makes individuals feel the pressure to conform, which subsequently influences their behaviors (Cialdini et al., 1991; Kusumi et al., 2017). We expect individual risk perception to interact with the public opinion climate to influence the impressions of destination image and subsequent satisfaction with the destination visitation experience. **In other words, the effect of personal risk perception (pre- and post-travel) on a destination image and satisfaction varies across levels of a public opinion climate of risk. According to the negativity dominance principle (Rozin & Royzman, 2001), in the situation of a high level of public risk climate, the effects are likely to be dominated by the public risk climate, while the effect of personal risk perception**

tends to be weak. In the situation of a low level of public risk climate, a high-level personal risk perception will dominate the effects. Moreover, the high-level personal risk perception constitutes a cognitive dissonance with the low-level public opinion climate, which may arouse discomfort, concern or worries (Festinger, 1962), as a result, the effect of personal risk perception on destination image and satisfaction will be strong. Therefore, we hypothesize that the higher levels of public opinion of risk climate, the weaker the effect of personal risk perception on destination image and satisfaction. Thus:

H4: Public opinion climate **negatively** moderates the relationships between:

- a) pre-travel risk perception and destination image (H4a);
- b) post-travel risk perception and destination image (H4b);
- c) pre-travel risk perception and satisfaction (H4c); and
- d) post-travel risk perception and satisfaction (H4d).

Figure 1 depicts the research model and hypotheses.

[Insert Figure 1 about here]

3. Method

3.1. Research context

Xinjiang, officially the Xinjiang Uygur Autonomous Region, located in the northwest of China bordering several countries including Pakistan, Afghanistan, Tajikistan, Kyrgyzstan, Kazakhstan and Russia. In recent decades, the region has been plagued with separatist conflicts and occasional terrorist attacks. Public opinion on the safety and security of Xinjiang was rather negative, and risk level was perceived as high by domestic tourists (Cheng & Yu, 2015). Therefore we selected Xinjiang as the tourism destination in this study.

3.2. Construct measures

All the construct measures were drawn from the extant literature. The measurement of risk perception was adapted from Lepp and Gibson (2003). It includes five items on aspects of cultural differences, street crime, terrorism, violence and unfriendly people. The measurement items of pre-travel risk perception are as follows: a) Before traveling, I was worried about Xinjiang's cultural differences; b) Before traveling, I was worried about possible street crime happened in Xinjiang; c) Before traveling, I was worried about possible terrorist attacks happened in Xinjiang; d) Before traveling, I was worried about the possible violence happened in Xinjiang; e) Before the traveling, I was worried that some people in Xinjiang are unfriendly to tourists. Post-travel risk perception has the same measurement structure but with different temporal adverbials and negative phrases. For example, “While visiting in Xinjiang, I think I do not need to worry ...”.

The measurement of destination image was based on (Lee & Lockshin, 2011), with 5 items: a) Xinjiang is a comfortable place to visit; b) Xinjiang is a hospitable

place to visit; c) Xinjiang is a beautiful place to visit; d) Xinjiang is a place with a pleasant climate; e) Xinjiang is a worthy place to visit.

Tourist satisfaction was based on the five-item scale developed by Oliver (1997): a) Overall, I am satisfied with the travel experience; b) I enjoy this traveling experience very much; c) I think this trip is worthwhile; d) I think this trip has reached my expectations; and e) I think my decision is a wise one.

We used five items to measure public opinion climate, adapted from the social environment of information sources by Fall (2000) and media impact scale by Keery, Van den Berg, and Thompson (2004): a) Friends around me feel that Xinjiang is not safe; b) The media often report unsafe news about Xinjiang; c) The information that Xinjiang is unsafe is widespread; d) Many people are talking about Xinjiang as unsafe; e) Public opinion is mostly negative about safety in Xinjiang.

The above items on a 7-point Likert scale (where 1= strongly disagree and 7= strongly agree). As items measuring post-travel risk perception were negatively phrased, their data were reverse-coded. The questionnaire also includes demographic variables include gender, age, educational background, occupation, and frequency of travel.

3.3. Sample and data collection

We conducted the survey in Xinjiang from July to August in 2016. The target population for this study is those tourists who traveled to Xinjiang for leisure purposes. The main locations of our survey were six major tourist attractions sites: Tianshan Tianchi Scenic Area, Tianshan Grand Canyon Scenic Area, Turpan Grape Valley Scenic Area, Nalati Scenic Area, Bosten Lake Scenic Area and Kanas Scenic Area, which covers all the well-known tourist attractions in Xinjiang.

The researchers personally distributed the questionnaires to the sampled tourists and collected them when completed. Before the data analysis, the dataset was examined for normality and the values of skewness and kurtosis of all the items well within Kline's (2011) conventional criteria (skewness < 3; kurtosis <8), which indicated that the data were normally distributed. Confirmatory factor analysis was employed to assess the (Kline, 2011). A total of 800 copies of questionnaires were distributed, 639 of them were considered as valid, thus a rate of 79.8%. The sample profile is presented in Table1 and the descriptive statistics are presented in table2.

[Insert Table 1 about here]

[Insert Table 2 about here]

3.4. Data analysis

The data analysis of this study consists of three steps. First, we used SPSS to conduct exploratory factor analysis with the even number of samples. Second, we run confirmatory factor analysis using AMOS with the odd number of samples. Thirdly, we used the PROCESS macro plug-in installed in SPSS to perform multiple chain tests of mediating effects and moderation effects.

4. Results

4.1. Exploratory factor analysis

Table 2 presents the results of the exploratory factor analysis. Mean imputation was used to estimate the missing data before the reliability test and validity test. Cronbach α value of the whole questionnaire is 0.770 and Cronbach α value of each dimension is above 0.7, which indicates good reliability. The results of the validity test show that: the KMO value of pre-travel risk perception and post-travel risk perception is 0.911, the KMO value of destination image is 0.845, the KMO value of tourist satisfaction is 0.874, the KMO value of public opinion climate is 0.863. All the factor loadings for each individual item are above 0.5. Thus, the validity of this questionnaire is acceptable.

[Insert Table 3 about here]

4.2 Confirmatory factor analysis

AMOS software was used to examine the discriminant validity of the major variables to establish the basis for the construction of the best model. The research chooses the oblique five-factor (five variables separately) as the basic model, establishing four competing factor models. All the potential choices – four-factor model (pre-travel and during visit risk perception belonging to the same latent variable, destination image, tourist satisfaction, public opinion climate) , three-factor model (tourist satisfaction, public opinion climate, combining risk perception and destination image), two-factor model (public opinion climate as an independent variable and the rest of them as latent variables) and one-factor model were tested. The results show that the five-factor model has the highest level of adaptation for this research. It also shows that the questionnaire has good discrimination validity and

quality. Table 2 and Table 3 display the overall fit index of the competition model and the result of CFA respectively.

[Insert Table 4 about here]

The results of the confirmatory factor analysis of the five-factor model are above the recommended level (Hooper, Coughlan, & Mullen, 2008). The CFA fit indices of pre-travel perception and post-travel perception were: $\chi^2/df=2.862 (<3)$, RMSEA=0.077 (<0.08), PGFI=0.582(>0.5), NFI=0.962, RFI=0.950, CFI=0.975, IFI=0.975, GFI=0.941; the CFA fit indices of destination image, tourist satisfactory and public opinion climate were: $\chi^2/df=2.901(<3)$, RMSEA=0.077(<0.08), PGFI=0.638(>0.5), NFI=0.928, RFI=0.910, CFI=0.951, IFI=0.952, and GFI=0.911.

4.2. Hypothesis test

4.2.1. Direct effect

Table 4 shows that both pre-travel risk perception and post-travel risk perception have a significant negative effect on destination image perception ($\beta=-0.043^*$, $t=-2.372$; $\beta=-0.544^{***}$, $t=-20.855$), which suggests that H1a and H1b are supported. Post-travel risk perception has a significant negative effect on tourist satisfaction ($\beta=-0.148^{***}$, $t=-5.554$), suggesting that the H2b is supported.

Table 5 presents that the total effect of pre-travel risk perception on tourist satisfaction is -0.2224 ($t=-9.831$, $p=0.000$), suggesting that the pre-travel risk perception has a significant negative effect on tourist satisfaction, so H2a is supported.

[Insert Table 5 about here]

[Insert Table 6 about here]

4.2.2. Mediating effect test

Table 5 shows that pre-travel risk perception has a significant effect on tourist satisfaction ($\beta=-0.2224^{***}$, $t=-9.831$) without adding any mediators. Pre-travel risk perception has no significant effect on tourist satisfaction ($\beta=-0.0006$, $t=-0.042$) after adding two mediators. This indicates that the effect of pre-travel risk perception on the satisfaction rate of tourists was fully mediated by post-travel risk perception and tourist destination image perception. Thus, H3 was supported.

[Insert Table 7 about here]

According to the latest recommendations by Hayes and Rockwood (2017), a model of two mediators (model 6) has three indirect effects: a) indirect effect 1 is transmitted indirectly only through M1; b) indirect effect 2 is transmitted indirectly only through M2, and c) indirect effect 3 is transmitted indirectly through M1 and M2 in order. Table 6 shows the three indirect effects (Ind1-3) in the current study. First, Ind1=-0.048, 95% BCa CI [-0.076, -0.026], which presents the indirect effect of pre-travel risk perception (X) on tourist satisfaction (Y) through post-travel risk perception (M1) only. Ind1 value accounts for 21.76 percent of the total effect. Second, Ind2=-0.034, 95% BCa CI [-0.066, -0.003], which presents the indirect effect of pre-travel risk perception (X) on tourist satisfaction (Y) through destination image perception (M2) only. Ind2 value accounts for 15.15 percent of the total effect. Third, Ind3=-0.140, 95% BCa CI [-0.173, -0.114], which presents the indirect effect of pre-travel risk perception (X) on tourist satisfaction (Y) through post-travel risk perception (M1) and destination image perception (M2) in order. Ind3 value accounts for 62.81 percent of the total effect. Total indirect effect =-0.2218, 95% BCa CI [-

0.257, -0.188], which accounts for 99.73 percent of total effect. This suggests the effect of pre-travel risk perception on tourist satisfaction was fully mediated through post-travel risk perception and destination image. The serial multiple mediator model estimate results were shown in Figure 2.

[Insert Figure 2 about here]

4.2.3. Moderation effect test

Moderation effect of public opinion climate among the paths of pre-travel risk perception → destination image, pre-travel risk perception → tourist satisfaction, post-travel risk perception → destination image, post-travel risk perception → tourist satisfaction, were tested through PROCESS micro (model 1) of SPSS. All variables were mean-centered before estimating the hypothesized models. The results show that all the interaction terms are significant. Specifically, public opinion climate significantly moderates the relationships: a) between pre-travel risk perception and destination image ($\beta=0.132^{***}$, $t=8.614$), b) between post-travel risk perception and destination image ($\beta=0.052^{**}$, $t=2.900$), c) between pre-travel risk perception and tourist satisfaction ($\beta=0.132^{***}$, $t=7.815$), and d) between post-travel risk and tourist satisfaction ($\beta=0.072^{***}$, $t=3.650$). Thus, H4a, H4b, H4c, H4d were all supported. The moderation effects can be visualized as shown in Figure 3.

[Insert Figure 3 about here]

5. Discussion and conclusions

This study examines the moderation effect of public opinion climate, as a variable of the social environment of destination risk information, on the effect of tourist risk perception on destination image and satisfaction, with the consideration of the formation process of individual risk perception and the public opinion climate, which has been largely neglected in previous studies. We further assess the difference as well as the interconnection between pre-travel and post-travel risk perception. The study has important implications for theoretical development and destination risk communication and management practice.

5.1. Theoretical implications

The contributions of this study to the theory are threefold.

First, this study is among the first to incorporate public opinion climate into tourist risk perception research. Specifically, we test the moderation effect of public opinion climate on the path of “pre-travel risk perception → post-travel risk perception → destination image → satisfaction”. Public opinion climate exists in the information environment throughout the tourist journey, and influences tourist’s perception, attitude and feelings (Binder et al., 2011; Brown, 2015; Kasperson et al., 1988; Kusumi et al., 2017). The results indicate that public opinion climate **negatively** moderates the link from risk perception, destination image and satisfaction evaluation. Specifically, when the public opinion climate of risk is low, slight changes in individual risk perception will have a big impact on satisfaction; but if the public opinion climate of risk is high, individual risk perception has little impact on satisfaction. **In other words, in the interaction between public opinion climate of risk and personal risk perception, the one with a higher level of negativity (greater risk)**

will exert a dominating effect, which is consistent with the negativity dominance principle (Rozin & Royzman, 2001). This negative moderation effect of public opinion climate is akin to that of the environment of noise: An increase of one's voice volume will have a stronger impact in a quiet environment than it will in a noisy environment.

The finding of the moderation effect of public opinion climate of risk highlights the importance of the social environment for tourism research, especially for tourism risk analysis (Jonas & Mansfeld, 2017; Moussaïd, 2013). The social environment could amplify or attenuate certain risk information (Binder et al., 2011; Kasperson et al., 1988; Kusumi et al., 2017). As a result, public opinion climate of risk might deviate from the actual risk, and an individual's personal perceived risk may be incongruent with the public one. Individuals constantly monitor their social environment to assess the 'climate' of public opinion (Noelle-Neumann, 1977), which might exert a normative power over the individuals to conform with the public opinion, resulting in cognitive dissonance (Festinger, 1962). The study thus further advances the literature on tourism risk analysis by showing the important and sophisticated role of public opinion climate in influencing individual risk perception, destination image and satisfaction.

Second, this study conceptually distinguishes between pre-travel risk perception and post-travel risk perception. The pre-travel risk perception is the risk assessment and judgment at the stage of the tourism planning stage, whereas post-travel risk perception is at the stage of visiting or consuming the destination. Our data results indicate that the risk perception before the visit is significantly higher than that at the visiting stage. The tourist's pre-travel risk perception was later adjusted as the tourist gained the actual personal experience of the destination. **The findings provide an**

important theoretical development over earlier studies that indicate that potential travelers are different from actual travelers in term of risk attitude (Larsen et al., 2009) and perception of the destination's image (González-Rodríguez, 2016; Jani & Hwang, 2011; Papadimitriou & Gibson, 2008).

Third, this study validates the negative effects of pre-travel risk perception and post-travel risk perception on destination image and satisfaction. The impact of risk perception on satisfaction is subject to debate in the extant literature. The empirical analysis of this study supports the negative impact mechanism from risk perception to satisfaction. Our findings show that pre-travel has a continuing impact on tourists' risk experience, which influences tourist perception of the destination's image and subsequent satisfaction with post-travel risk perception and destination image as two mediators. This study thus provides fresh insights into the mechanism from pre-travel risk perception to satisfaction (Chang, 2010; Filep et al., 2014; Quintal et al., 2010; Sohn et al., 2016; Yüksel & Yüksel, 2007).

5.2. Managerial implications

The findings of this study have important implications for destination marketing organizations. First, the study suggests that the formation of risk perception is a dynamic process, with individuals interact with their social environment and the perception evolves as they gain personal experiences of the destination. Destination managers should consider the whole process of tourist activities to inform their risk management strategies to provide tourists with a full range of low-risk or risk-free travel experiences from transport, food, accommodation, shopping, entertainment to any other components of tourist activities. Second, the study reveals that the social environment and specifically public opinion on the risk in destination has a moderation effect on tourist behavior. As the social environment tends to amplify or

attenuate the risk information, it rarely reflects the true level of risk at the destination, therefore destination managers should aim to contribute in creating a transparent and interactive risk information environment by engaging with all channels of communication, particularly social media, to interact with the public in risk events and the information process. Third, this study shows that potential tourists are likely to overestimate the risk, because of the lack of direct, personal experience of the destination. Destination managers should strive to provide a constant flow of vicarious personal experience of the destination, by encouraging existing tourists to talk about their opinions, feelings and stories. These vivid travel stories should relieve potential tourists from over worry.

5.3. Limitations and further research

This study has several limitations and implications for further research. First, this study marks the first attempt to integrate a variable of social environment into studying individual tourist risk perception, public opinion climate. The social environment is a much broader concept (Binder et al., 2011; Kasperson et al., 1988; Kusumi et al., 2017) and future research could explore the effect of factors such as interpersonal communication of risk information (Kusumi et al., 2017), as well as public opinion on risk events (Noelle-Neumann, 1977), the interaction between the constructs in influencing tourist behavior and social well-being. **Moreover, future research could generate great insights for destination marketing and management by exploring the use of spiral of silence theory of public opinion (Noelle-Neumann, 1974) and social amplification of risk framework (Kasperson et al., 1988) to examine destination risk communication process.** Second, the data of this study were obtained from a cross-sectional survey with a sample of domestic tourists in a single destination, therefore caution should be taken when generalizing the results to other

contexts. Nevertheless, this study represents a starting point for future research on the role of the social environment of risk information and travel behavior. Future research could compliment this study by using different sources of empirical data to address this issue. **For example, future research should use longitudinal designs or data mining of online social media data (González-Rodríguez, 2016), which would allow for analysis of changes between pre- and post-travel risk perceptions.**

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Tables

Table 1. Sample profile (n=639)

	Category	Frequency	Percentage
Gender	Male	276	43.19
	Female	363	56.81
Age	Born in and after 2000	65	10.17
	Born in 1990s	119	18.62
	Born in 1980s	238	37.24
	Born in 1970s	129	20.19
	Born in 1960s	58	9.08
	Born in or before 1950s	30	4.67
Education	Junior high school or below	48	7.51
	Senior high school	204	31.92
	Junior college	144	22.53
	Bachelor degree	212	33.18
	Master degree or above	28	4.38
Travel frequency	Rarely	84	13.15
	Sometimes	402	62.91
	Often	151	23.63
Occupation	Enterprise staff	62	9.7
	Civil servant	47	7.35
	Academics	42	6.57
	Self-employed	108	16.9
	Soldier	5	0.78
	School students	121	18.93
	Professionals and technicians	54	8.45
	Freelance	102	15.96
	Retiree	53	8.29
	Other	45	7.04

Monthly income	≤2500 RMB	171	26.76
	2501-5000 RMB	333	52.11
	5001-10000 RMB	112	17.53
	≥10001 RMB	21	3.29

Table2. Descriptive statistics

Construct	Measurement item	mean value	SD	skewness		kurtosis	
				Statistic	Standard error	Statistic	Standard error
Pre-travel risk perception	PV1	3.16	1.98	0.16	0.10	-1.54	0.19
	PV2	3.20	1.98	0.22	0.10	-1.34	0.19
	PV3	3.36	2.09	0.19	0.10	-1.38	0.19
	PV4	3.14	1.96	0.29	0.10	-1.31	0.19
	PV5	3.19	2.00	0.22	0.10	-1.43	0.19
Post-travel risk perception	DV1	2.50	1.58	0.98	0.10	0.25	0.19
	DV2	2.36	1.51	1.13	0.10	0.62	0.19
	DV3	2.35	1.48	0.91	0.10	-0.07	0.19
	DV4	2.35	1.54	1.03	0.10	0.21	0.19
	DV5	2.13	1.36	1.34	0.10	1.48	0.19
Destination image	DI1	5.89	1.40	-1.49	0.10	1.97	0.19
	DI2	6.11	1.31	-1.76	0.10	3.02	0.19
	DI3	6.18	1.17	-1.95	0.10	4.63	0.19
	DI4	6.04	1.19	-1.26	0.10	1.13	0.19
	DI5	6.03	1.27	-1.37	0.10	1.47	0.19
Tourist satisfaction	TS1	5.98	1.30	-1.48	0.10	2.27	0.19
	TS2	5.99	1.25	-1.24	0.10	1.14	0.19
	TS3	6.03	1.27	-1.46	0.10	1.91	0.19
	TS4	6.01	1.28	-1.44	0.10	2.05	0.19
	TS5	5.92	1.38	-1.34	0.10	1.41	0.19
Public opinion climate	PR1	3.09	1.80	0.31	0.10	-1.07	0.19
	PR2	3.37	1.71	0.00	0.10	-1.15	0.19
	PR3	3.50	1.74	-0.03	0.10	-1.13	0.19
	PR4	3.67	1.75	-0.15	0.10	-1.05	0.19
	PR5	3.82	1.76	-0.32	0.10	-1.00	0.19

Table 3. Exploratory factor analysis and confirmatory factor analysis

Construct	Measurement item	Mean value	Exploratory factor analysis			Confirmatory factor analysis			
			Communality	Factor loading	Cronbach α value	Factor loading	t	AVE	CR
Pre-travel risk perception	PV1	3.16	0.833	0.895	0.919	0.868	19.362	0.790	0.949
	PV2	3.20	0.814	0.854		0.901	20.571		
	PV3	3.36	0.813	0.882		0.891	20.218		
	PV4	3.14	0.835	0.874		0.898	20.486		
	PV5	3.19	0.848	0.897		0.885	19.967		
Post-travel risk perception	DV1	2.50	0.685	0.782	0.882	0.745	14.977	0.620	0.891
	DV2	2.36	0.803	0.870		0.819	17.196		
	DV3	2.35	0.775	0.854		0.756	15.316		
	DV4	2.35	0.774	0.865		0.858	18.460		
	DV5	2.13	0.701	0.811		0.754	15.253		
Destination image	DI1	5.89	0.707	0.841	0.912	0.754	15.469	0.575	0.871
	DI2	6.11	0.669	0.818		0.691	13.711		
	DI3	6.18	0.601	0.775		0.684	13.544		
	DI4	6.04	0.695	0.834		0.809	17.163		
	DI5	6.03	0.741	0.861		0.841	18.211		
Tourist satisfaction	TS1	5.98	0.718	0.848	0.888	0.819	17.578	0.692	0.918
	TS2	5.99	0.754	0.868		0.882	19.799		
	TS3	6.03	0.80	0.894		0.841	18.323		
	TS4	6.01	0.724	0.851		0.815	17.440		
	TS5	5.92	0.718	0.847		0.799	16.943		
Public opinion climate	POC1	3.09	0.600	0.774	0.888	0.629	11.479	0.550	0.858
	POC2	3.37	0.680	0.825		0.769	15.112		
	POC3	3.50	0.723	0.850		0.854	17.336		
	POC4	3.67	0.719	0.848		0.761	14.779		
	POC5	3.82	0.736	0.858		0.674	12.485		

Table 4. The overall fit indexes of the competition model

Model	X ²	df	X ² /df	$\Delta X^2/\Delta df$	RMSEA	CFI	NFI	AIC	RMR
One-factor model	3086.626	275	11.224	551.715	0.179	0.565	0.543	3186.626	0.523
Two-factor model	2534.911	274	9.252	1114.794	0.161	0.650	0.625	2636.911	0.525
Three-factor model	2305.324	272	8.475	252.783	0.153	0.685	0.659	2411.324	0.413
Four-factor model	1546.974	269	5.751	187.270	0.122	0.802	0.771	1658.964	0.295
Five-factor model	797.895	265	3.011	-	0.080	0.918	0.882	917.895	0.133

Table 5. Estimate result of regress analysis of serial-multiple mediation model

	Model 1			Model 2			Model 3		
	Post-travel risk perception			Destination image			Tourist satisfaction		
	β	SE	t	β	SE	t	β	SE	t
Constant	2.182***	0.335	6.505	6.961***	0.227	30.712	1.832***	0.282	6.504
Gender	0.146	0.089	1.641	0.075	0.058	1.282	-0.047	0.046	-1.022
Age	-0.003	0.038	-0.081	-0.036	0.025	-1.433	-0.033	0.020	-1.705
Education	-0.163***	0.044	-3.682	0.014	0.029	0.464	0.043	0.023	1.880
Occupation	-0.022	0.017	-1.288	0.008	0.011	0.758	-0.010	0.009	-1.120
Income	-0.117	0.067	-1.745	-0.057	0.044	-1.289	-0.036	0.035	-1.041
TF	0.030	0.081	0.368	0.031	0.053	0.579	-0.037	0.042	-0.884
TE	-0.149*	0.069	-2.155	0.201***	0.045	4.415	0	0.036	0.001
Pre-travel RP	0.327***	0.024	13.391	-0.043*	0.018	-2.372	-0.001	0.014	-0.042
Post-travel RP	–	–	–	-0.544***	0.026	-20.855	-0.148***	0.027	-5.554
Destination image	–	–	–	–	–	–	0.786***	0.031	25.068
Model Summary	R ² =0.527 p=0.000			R ² =0.738 p=0.000			R ² =0.869 p=0.000		

Notes: *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$. RP: Risk Perception ; DI: Destination image; TS: Tourist Satisfaction; TF: Travel Frequency; TE: Travel Experience.

Table 6. Total and direct effect of pre-travel risk perception on tourist satisfaction

	Effect	SE	t	p
Total effect of X on Y (c)	-0.2224	0.023	-9.831	0.000
Direct effect of X on Y (c')	-0.0006	0.014	-0.042	0.966

Table 7. Indirect effect of pre-travel risk perception on tourist satisfaction

Indirect effect(s) of X on Y	Effect	Ratio	Boot SE	BootLLCI	BootULCI
Ind1	-0.048	21.76%	0.013	-0.076	-0.026
Ind2	-0.034	15.15%	0.016	-0.066	-0.003
Ind3	-0.140	62.81%	0.015	-0.173	-0.114
Total indirect effect	-0.2218	99.73%	0.018	-0.257	-0.188

Notes: Ind1: Pre-travel Risk Perception → Post-travel Risk Perception (M1) → Tourist Satisfaction

Ind2: Pre-travel Risk Perception → Destination image (M2) → Tourist Satisfaction

Ind3: Pre-travel Risk Perception → Post-travel Risk Perception (M1) → Destination image (M2) → Tourist Satisfaction

Figures

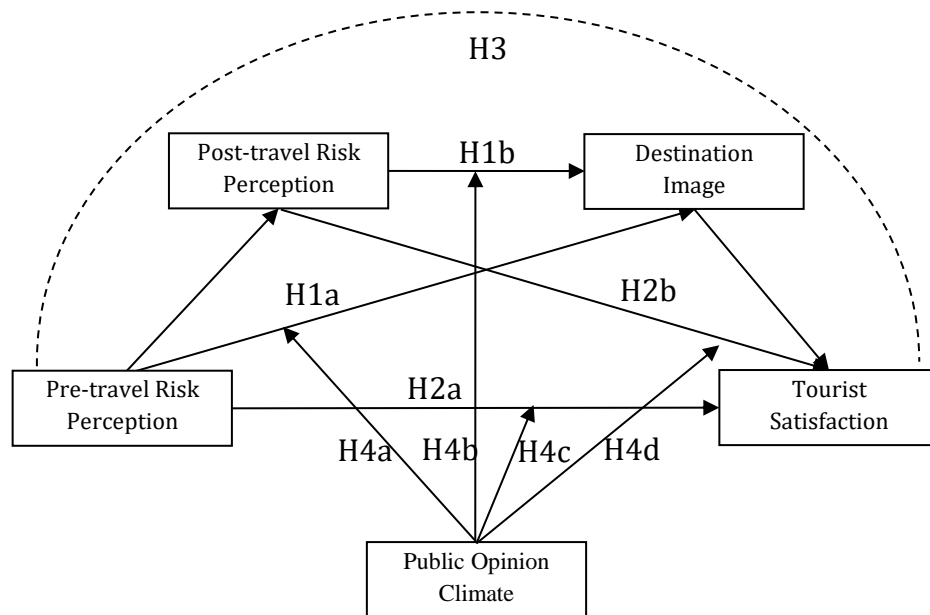


Figure 1. Conceptual model

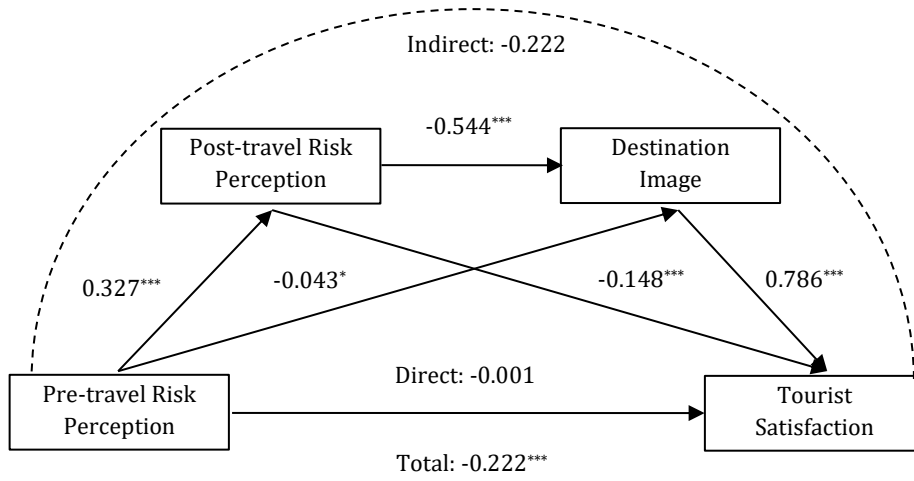


Figure 2. Results of hypothesis testing

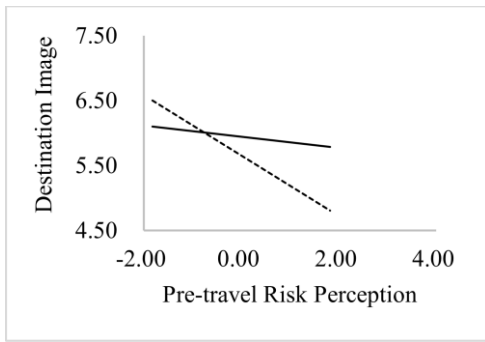


Fig 3a

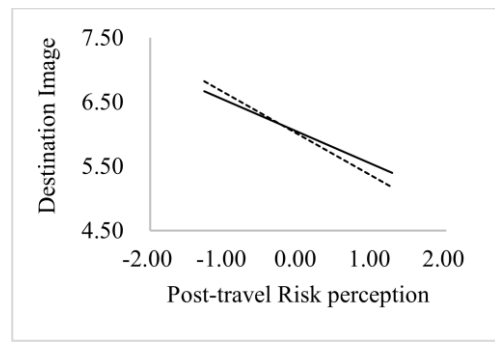


Fig 3b

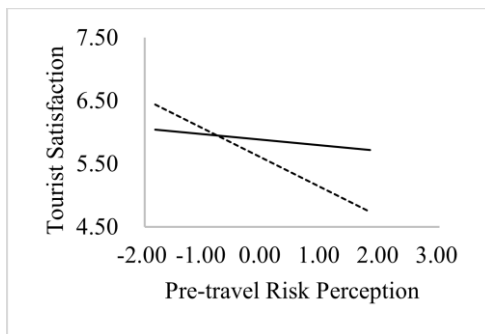


Fig 3c

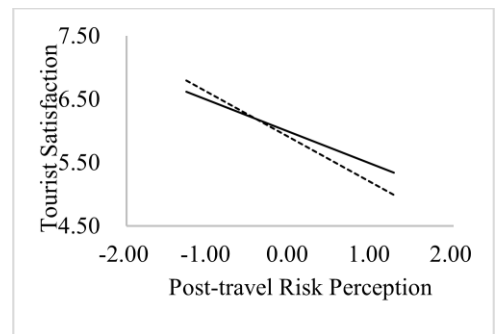


Fig 3d

Levels of public opinion climate
 -1 SD ——— +1 SD

Figure 3. A visual representation of the curvilinear of moderation test results