Developing a scale to measure tourist perceived safety

Abstract

Safety for tourists at places visited is essential to their enjoyment and experiences, as well as a determinant of destination success. Yet, little attention has been paid to the conceptualization and scale development for tourist perceived safety at destinations (TPSD). The primary purpose of this research was to identify the dimensions of TPSD and develop a scale for measuring it based on safety system theory. A three-stage study in a mixed-method design was conducted to develop and validate TPSD. Stage 1 identified the dimensions and initial items of TPSD through extensive literature reviewing and content analysis of travel blogs. In stage 2 (n = 300), an explanatory factor analysis was conducted to refine and validate the preliminary items. Stage 3 (n = 1,830) provided empirical support for a 20-item, five-dimension (human, facility and equipment, natural environment, social environment, management) TPSD scale through confirmatory factor analysis.

Keywords

Introduction

Safety is a basic need of tourists. People are highly sensitive to safety and security issues in tourism decision-making, and even minor crises in one part of the world may trigger strong tourism demand reactions in other areas through the "effect of generalization"

(Seabra, Dolnicar, Abrantes, and Kastenholz, 2013). Peace, safety and security are the

critical conditions for the normal development of destinations, and thus are basic

determinants of success (Cavlek, 2002; Chauhan, 2007; Amir, Ismail, and See, 2015).

Many types of safety risks and crises are present in contemporary tourism, which can

have devastating effects on destinations, including the Corona virus pandemic of early

2020. Consequently, strengthening safety management systems and creating conditions

for tourists to feel safer are critical to the sustainable development of destinations.

Safety is a stable and orderly condition, and safety concerns and risks are present as

parallel concepts (Sönmez and Graefe, 1998). Normally, travel safety is a concept that is

the opposite to travel risk. Travel risk is defined as the possibility of experiencing danger

while engaging in travel or the consciousness of security and knowledge of the likelihood

of harm during travel (Fischhoff, Watson, and Hope, 1984; Park and Reisinger, 2010).

Thus, travel safety is defined as the degree of risk that can be tolerated during travel,

which is a collective term for tourism activities in a balanced, stable and orderly

condition. Generally, travel safety is manifested in the normal condition of tourists

without threat, loss, or injury during travel (Chauhan, 2007; George, 2003; 2010), and

tourist personal assessments of these conditions constitutes TPSD (Chauhan, 2007).

TPSD is a subjective impression and assessment of safety information and aspects based

on people's past experiences (Seabra et al., 2013). Crisis events, such as terrorism, crimes,

and natural disasters, are recognized as critical determinants of the levels of TPSD

(Seabra et al., 2013; George, 2003). However, the incidents and safety information

available to tourists at destinations vary in sources, types, and nature. Additionally, the information may be influenced by the characteristics of the natural environment (Rittichainuwat, 2013), tour leader service quality (Wang, Jao, Chan, and Chung, 2010), or management actions of government (Kılıçlar, Uşaklı, and Tayfun, 2017). George (2003) argued that tourist perceptions of safety and security may be derived from several sources, such as personal experiences of crime, discussions with friends about crime, and exposure to crime through mass media as well as perceptions of police effectiveness. These different sources and amounts of safety information lead to varying types and levels of TPSD. For example, terrorist attacks and natural disasters are two crises dissimilar in circumstances and causes. Terrorist attacks reduce safety expectations and confidence, and lead to sharp declines in tourism demand (Kapuściński and Richards, 2016; Pizam and Smith, 2000). Natural disasters are more readily understood by tourists because of their unpredictability and lack of human involvement and negative influences on TPSD are more limited (Rittichainuwat, 2013; Okuyama, 2018). Therefore, it is suggested that there are hierarchical levels of tourist safety perceptions and the identification of TPSD dimensions could deliver guidance for destinations to offer safer environments and have effective management practices in crises.

Currently, TPSD is an important construct in tourism research and many scholars have measured it in different situations with diverse scales (Echtner and Ritchie, 1993; George, 2003; 2010; Rittichainuwat and Chakrabort, 2012). The measurement of TPSD could be described in three ways. First, TPSD is measured as a sub-dimension of

destination image. For example, to measure the components of destination image completely, Echtner and Ritchie (1993) regarded safety perception as a sub-dimension of destination image, reflecting tourist evaluations of image elements of friendliness, comfort, and security. To some extent, safety perception is subordinated to tourist perception of destination safety image, and it is a prerequisite for an ideal destination image (Chauhan, 2007; Chi and Qu, 2008; Chen, 2007). George (2003) also mentioned that if tourists feel unsafe or threatened at destinations, they can develop negative impressions. Second, TPSD is considered to be a one-dimensional measurement structure for assessing tourist safety perceptions in diverse situations (such as touring, shopping, driving). For example, TPSD is measured by asking tourists to express their overall sense of safety on a number of issues, such as walking streets at night, touring cities in the daytime, using public transportation, driving around cities, and staying in accommodations (George, 2003). This is the most widely used measurement approach for TPSD currently (Patwardhan et al., 2020). Baokye (2012) argued that tourist conceptions of safety are informed by tourism product quality and their perceptions of safety are organized around a three-pronged platform of privacy, orderliness, and professionalism. Thus, TPSD is measured as a multi-dimensional construct in a specific context and orientation. For example, Rittichainuwat and Chakrabort (2012) explored the perceived importance of safety and security measures from the perspective of tourists and service providers. A six-factor pattern of detectors, crisis management, airport and hotel checks, emergency kits, warning systems, and disease control instruments were identified

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(Rittichainuwat and Chakraborty, 2002). Lee et al. (2018) investigated air passenger perceptions of pre-flight safety communication in the context of the commercial airline industry, which consisted of three sub-dimensions (regulation and safety equipment, instructions for equipment, and general information) (Chia-Chen, Wang, and Hsu, 2018). Thus, various measurement structures of TPSD have been proposed, such as the non-independent structure (sub-dimension of destination image), independent structure, and multi-dimensional structure, and the resulting measurement scales have helped to assess tourist safety perceptions in specific situations and travel contexts. However, situations and contexts vary greatly, and these scales often need to be revised because of their limited scope. Therefore, it is imperative that the TPSD measurement structure be systematically examined from a general perspective and to develop a solid theoretical base, which will contribute to the stability and universality of TPSD measurement, filling a significant research gap in tourism research.

Tourist safety perceptions have a major impact on the development of destinations. Due to social, cultural, political, and other external risk factors, the safety perceptions of tourists from different countries and in different contexts are diverse (Seabra et al., 2013). For example, China has a large and growing domestic tourism market and the Chinese lead the world in terms of outbound international tourism expenditures (Li, 2016; UNWTO, 2018, p. 14). China, with a complex geographical environment, has a variety of destinations with diverse tourism resources and complex safety risk elements, which may comprehensively represent tourist safety perceptions in diverse tourism situations.

Recently inside and outside of China, several serious accidents (e.g., Phuket, Thailand drownings in 2018; DongFang Star cruise capsizing in the Three Gorges in 2015), involving significant Chinese tourist fatalities, as well as the more recent Corona virus pandemic, have aroused greater attention among Chinese tourists to safety issues, and even become a critical factor influencing travel decisions. Given that perceived safety is a key factor for the development of destinations, it is therefore worthwhile to develop a TPSD scale with respect to Chinese tourists.

The primary purpose of this research was to fill a literature gap by developing a reliable and valid scale for measuring TPSD through a mixed-method research design, which would help to define the construct and identify the sources of safety elements. The rest of this work is organized as follows. First, a clear conceptualization of TPSD is provided based on safety system theory and the 4M analysis framework. Second, a reliable and valid scale for measuring TPSD is proposed and confirmed. Finally, the theoretical contributions and practical implications are discussed.

Theoretical Background

There are multiple theories that have been advanced for safety, risk, and accidents. Wildavsky and Dake (1990), for example, reviewed five alternative theories of risk perception (knowledge, personality, economic, political, and cultural). One of their key findings was that "perception of danger is selective" and depends on the situation or specific risk that an individual faces. After testing the alternate theories, they concluded that cultural theory was the best in predicting perceived risk and who was likely to be

afraid and unafraid. Weber and Johnson (2009), in reviewing decisions under uncertainty, cited expected value theory, expected utility theory, risk-return models, and prospect theory. However, Loewenstein et al. (2001) criticized previous theories in being almost exclusively cognitive without giving any attention to feelings and emotions.

Having reviewed the potential theories on which to base this research and giving due consideration to the particular culture that exists in China, the research team decided to use safety system theory. Tourism represents a specific risk situation and as yet does not have its own dedicated theory related to safety.

Safety System Theory

A system is composed of several elements that interact and depend on each other according to a specific structure and is a unified whole with a specific function. The safety system is composed of safety elements in a specific form and is a system that realizes safety and security functions (Edwards, 1972; Rasmussen and Suedung, 2000; Leveson, 2004; Li, Zhang, and Liang, 2017). Safety system theory identifies the common patterns of accidents and safety management from the perspective of a system, and its main research concepts include accident and safety systems (Leveson, 2011; Lower, Magott, and Skorupski, 2018). The accident system involves four elements, e.g. dangerous behavior of humans, unsafe condition of facilities, risks in the environment, and insufficient management measures, commonly referred to as the "4M" elements (Page, Bentley, and Walker, 2005; Xie, Zhang, Chen, Morrison, and Lin, 2020). The elements of the safety system are comprised of human safety capabilities (e.g., ability,

knowledge, and psychological safety); safety and reliability of equipment and

environments (e.g., intrinsic, design, and use safety); safety functions of energy

production processes (e.g., effective control of energy); and safety information flow (e.g.,

effective management procedures) (Edwards, 1972). Thus, the 4Ms can be used to

analyze the four risk factors leading to accidents and the four safety elements to ensure

system safety.

TPSD indicates tourist subjective evaluations and assessments of various safety

elements and conditions at destinations. In other words, TPSD can be conceptualized as

tourist perceptions of the "travel safety system" and it integrates assessments of the

risk-induced factors of the accident system and the elements of the safety system. In

addition, safety perceptions can be understood as feelings of being "safe" and being

protected against risks posed by any undesirable events (Sönmez and Graefe, 1998). Thus,

TPSD involves a complex and dynamic cognitive process that occurs with the interaction

of these four elements (4Ms). Effects, threats, and any other deviations influence tourist

safety expectations and assessments and create negative TPSD. Currently, safety system

theory has been widely recognized and applied in the fields of coal mining (Song and Xie,

2014), marine transportation (Chen, 2014), construction projects (Jamot and Park, 2019)

and engineering management (Mao and Xu, 2011). In tourism, Bentley and Page applied

the 4M analysis framework to investigate the nature and extent of New Zealand

adventure tourism injury problems, and a range of client, equipment, environmental, and

organizational risk factors were identified (Page, Bentley, and Walker, 2005; Bentley,

Page, Meyer, Chalmers, and Laird, 2001). Thus, it is appropriate to introduce safety

system theory into TPSD research and this investigation identified the tourist safety

perception structure at destinations based on safety system theory and the 4M analysis

framework.

Tourist Perceived Safety at Destinations (TPSD)

Tourist perceived safety is based on a comprehensive judgment of the stability of the

destination, including the anticipated level of safety for the physical self and personal

property. It is the expressible set of positive imagery that promotes normal tourism

activities, such as a reliable tourism sector, stable social order, balanced environment, and

the friendliness of locals (Chauhan, 2007; George, 2003; 2010; Koo, Collins, Williamson,

and Caponecchia, 2019). To some extent, TPSD is the perceived image of the safety of a

destination. Thus, TPSD has been identified as an antecedent influencing people's travel

decision-making processes, which has a fundamental impact on satisfaction, loyalty, and

revisit intentions (Fourie, Rossello-Nadal, and Santana-Gallego, 2020; Patwardhan et al.,

2020; Sönmez and Graefe, 1998).

Tourists form safety assessments based on different sources of safety information to

which they are exposed (Seabra et al., 2013), such as natural environments, public

security systems, interactions between tourists and residents, and facilities and equipment.

Also, TPSD is affected by people's evaluations in particular behavioral settings (e.g.,

adventure travel vs. rural tourism) and specific destination locations (e.g., mountainous

areas vs. plains). Grounded upon the 4M analysis framework and safety system theory, this research conceptualized TPSD as a multi-dimensional construct consisting of humans, facilities and equipment, environments, and management (4Ms).

Perceived Safety of Human Elements (PSH)

PSH refers to safety assessments and perceptions of individual behavior in tourism settings. It is an expressible set of positive human dimensions associated with normal tourism activity. This includes the behavior of tour guides, tourism operators, residents, fellow travelers, and tourists themselves. Variations in gender, age, risk tolerance, risk-related competencies, and prior knowledge among individuals may generate differences in the processing of safety information about destinations, thereby affecting TPSD (Sönmez and Graefe, 1998; George, 2010; Williams and Baláž, 2013; Sharifpour, Walters and Ritchie, 2014; Fourie et al., 2020). For example, the phenomenon of misbehavior is common in tour groups. This can result in verbal and physical violence, and frauds, scams and theft that disrupt tour itineraries and damage travel experiences, leading sometimes to injuries or loss of personal property (Tsaur, Cheng, and Hong, 2019). In addition, the features of intangibility, perishability, and inseparability of services exacerbate the safety of tourism activities (Mitchell and Greatorex, 1993; Williams and Baláž, 2013). Service quality and the safety awareness of tourism operators are critical factors promoting actual and perceived safety, which constitute an important component of TPSD as well (Caber and Albayrak, 2016). Additionally, the emotional

solidarity (positive sentiments one feels for another) with residents underpins the perception of safety. High levels of emotional solidarity (particularly to the dimension of feeling welcome) encourage tourists to perceive destinations as relatively safe (Woosnam, Shafer, and Scott, 2015).

Perceived Safety of Facility and Equipment Elements (PSFE)

PSFE refers to safety assessments and perceptions of the state of facilities and equipment within destinations. They represent the demonstrable set of positive facility and equipment elements that support normal tourism activity. The facilities and equipment in destinations must be regularly inspected and tested, maintained, and updated. Also, the appropriate matching of facilities and equipment with the specific tourists being served further enhances safety (Bentley et al., 2001).

The stable and secure operation of facilities and equipment is an important safety factor for tourists who are already within destinations. In hotels, people are concerned about safety standards of particular facilities and equipment. For example, fire prevention systems, emergency lighting systems, electronic door-locks, food safety, and safety screening are important factors in hotel selection (Chan and Lam, 2013; Sierra, Rubio-Romero, and Gámez, 2012). People with physical disabilities (PwPD) have elevated safety expectations and perceptions regarding accessibility, assistive devices, and professional equipment, which are significant predictors of their hotel satisfaction (Ozkan, 2017). For adventure travel, high-risk activity such as whitewater rafting, hang-gliding, mountain- and rock-climbing, bungee jumping, and scuba diving are highly

dependent on the safety performance of equipment and facilities, and those who assist them. Failures in these lead to accidents and readily create negative safety impressions of destinations and operators. Adding risk warning systems serves as a way to more effectively communicate levels of dangers and the appropriate behaviors and enhance safety perceptions of destinations and operators (Rittichainuwat, 2008, 2013). Thus, the safety of facilities and equipment is a tool for promoting activities and constitutes an important information element for TPSD.

Perceived Safety of Environmental Elements (PSE)

PSE refers to safety assessments and perceptions of the environmental elements of destinations. They are the articulable positive environmental elements that underlie normal tourism activity. There are two sub-categories of the natural environment and the social-cultural context. Information about safety concerns in natural environments and in particular societies has a positive impact on TPSD, although their characteristics and sources are different.

The natural environment is composed of physical resources such as water bodies, mountains, vegetation, wildlife, and climate. They provide an attraction base for the development of destinations and carry information for people to assess safety risk levels. For example, destinations with high-quality and popular natural landscapes, such as pristine beaches, stunning scenery, and distinctive fauna and flora (Chen and Tsai, 2007; Hosany, Ekinci and Uysal, 2007) allow tourists to experience feelings of self-satisfaction, comfort, and enjoyment. Areas prone to natural disasters are different, including

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volcanoes and locations of prior natural disasters. People form their own safety

assessments of these places by obtaining relevant data and incident information, and this

shapes their safety perceptions (Rittichainuwat, 2013). Climate-sensitive places are

complex and multifaceted (Scott and Lemieux, 2010) and may exert particular influences

on traveler perceptions. Climate change is leading to an increase in extreme weather

conditions (e.g., rising ocean levels, acid rain, haze, and heatwaves), which have a

negative impact on travel planning and perceptions of comfort and safety (Freitas, 2010;

Mansfeld, Freundlish, and Kutiel, 2004; Hübner and Gössling, 2012). Climate change is a

limiting factor that poses risks to be managed by tourists and destinations. Additionally,

destinations in alpine, polar, or desert regions have higher levels of sightseeing

environment risk, where people are more likely to suffer harm and personal injury such as

altitude sickness, hypothermia, or becoming lost (Eitzinger and Wiedemann, 2007).

The social-cultural context is an environmental system created by human social

activities, including politics, economics, culture, and local communities. Risks at a global

level such as political instability (Gartner and Shen, 1992), economic crises (Alegre,

Joaquín, Mateo, and Pou, 2013), international terrorism (Pizam and Smith, 2000; Sönmez

and Graefe, 1998; Jenkin, 2006), and war (Smith, 1998) shape travel safety perception at

a macro level, and eventually increase the psychological burden on tourists in unfamiliar

surroundings. People who are already within destinations may be more concerned with

such risks and form individualized safety perceptions by obtaining local information

about orderliness, conflicts, and consumption safety. For example, walking streets after

dark is a good indicator for measuring TPSD because it clearly indicates the level of

public security in a destination (George, 2003). Ryan (2003) described tourists as

"displaced" persons, who sacrifice normal responsibility and are more risk-prone in

unfamiliar areas (Eitzinger and Wiedemann, 2007). People may be victims of theft,

robbery, misunderstandings, or violation of road rules even leading to traffic accidents.

Therefore, they are more concerned about safety information on public security and

transportation (Wilks, Watson, and Faulks, 1999; Choocharukul and Sriroongvikrai,

2017). The quality of foodservice and the availability of a range of prices play an

important role in destination choices and experiences (Sheldon and Fox, 1988). Food

safety and local hygiene standards constitute significant elements of destination selection

and safety perceptions (MacLaurin, 2004; Lee, Pennington-Gray, and Kim, 2019). Safety

while shopping is another key area for retail experience evaluations (Yuksel, 2004).

In summary, the safety information on natural environments and social-cultural

contexts differs in risk characteristics, sources, and consequences, leading to the

formation of two types of perceived environmental safety: perceived safety of natural

environments (PENE) and perceived safety of social environments (PSSE). In addition,

compared with natural disaster crises, unpredictable and man-made events (e.g., terrorist

attacks) may have a more harmful influence on safety perceptions and destination loyalty

(Utz, Schultz, and Glocka, 2013; Breitsohl and Garrod, 2016). Thus, it is appropriate to

measure PENE and PSSE separately.

Perceived Safety of Management Elements (PSM)

PSM refers to safety assessments and perceptions of tourism safety management policies

and actions and related aspects at the organizational or managerial levels. They represent

positive management elements that support normal tourism activity. Destinations should

implement special management initiatives, including safety system elements

(Rittichainuwat, 2013; Becken and Hughey, 2013; Rittichainuwat, 2008) (e.g., security

institutions, contingency plans) and safety behavioral elements (safety information,

police and emergency rescue services) (Tyagi, Dhar, and Sharma, 2016; Gurtner, 2016;

Putra, 2010). People may encounter these management systems at the destination,

influencing their safety perceptions of management. For instance, several countries, such

as the UK, Australia, and Spain, have created safety regulations to avoid injuries and

deaths in diving tourism and at beaches (Coxon, 2006). Safety measures by government,

such as warnings, crisis management and disaster recovery plans enhance the safety

images of destinations and can restore tourist confidence even after a crisis (Yetta, 2016;

Putra, 2010; Rittichainuwat, 2013). Rittichainuwat (2013) argued that the perceptions of

inbound tourists of beach safety were dependent on the availability of a crisis

management plan and tsunami evacuation system (Rittichainuwat, 2013). Additionally,

several popular destinations (e.g., South Korea, Thailand, and Turkey) have established

special tourism police units to deal with security issues. The police culture and police

service quality play important roles in determining tourist safety expectations and

perceptions of destinations (Tyagi, Dhar, and Sharma, 2016). Generally, the safety

management of tourism enterprises, such as pre-flight safety announcements on airlines

(Chia-Chen, Wang, and Hsu, 2018), safety and security systems in hotels (Chan and Lam, 2013), and crisis management plans of tourist attractions (Rittichainuwat, 2013), improve safety perceptions of destinations. Thus, PSM describes the safety expectations and perceptions regarding the organizational safety practices within destinations.

Scale Development

With the guidance of the scale development procedures of Churchill (1979), this research employed a mixed-method design to prepare the TPSD scale. A reliable and valid measurement for TPSD was developed based on three stages (Figure 1).

[Insert Figure 1 about here]

Stage 1: Theme Identification and Item Generation

Since an adequate conceptual model and measurement scale for TPSD did not exist, a literature review and content analysis of travel blogs assisted with identifying the dimensions and generating initial items for a TPSD scale (Table 1).

[Insert Table 1 about here]

First Initial Item Pool

A broad review of the literature about TPSD was done to generate the first initial item pool for the measurement of TPSD. According to the 4M analysis framework, the current research treated TPSD as a multidimensional construct with five dimensions: PSH, PSFE, PSNE, PSSE, and PSM. Table 2 summarizes the previous research relevant to TPSD items based on these dimensions. Seventeen themes and 29 items were identified and

grouped into the five dimensions for measuring TPSD from the perspectives of safety system theory and the 4M analysis framework. For each dimension, the number of themes varied from two to eight, with three themes and six items for PSH (tour guides, residents, and tourism operators); three themes and seven items for PSFE (fully equipped, professional facilities, and good quality); two themes and two items for PSNE (weather and landscape); four themes and eight items for PSNE (transportation, sanitation, consumption safety, and public safety); and five themes and seven items for PSM (emergency plan, emergency evacuation, warning system, safety communication, and police capability).

[Insert Table 2 about here]

Second Initial Item Pool

The rapid development of Internet technology enables individuals to share their travel-related opinions, experiences, and concerns on online platforms (Li, Law, Vu, Jia, and Zhao, 2015). Travel blogs represent user-generated content (UGC), which clearly reflects tourist spatial movements, emotional experiences, and safety perceptions in an easily recordable and non-intrusive manner. The second initial item pool was developed through the content analysis of travel blogs from Ctrip, the most influential online travel community in China, to supplement the first item pool. The platform is host active, large, has loyal user groups, and features high levels of openness and significant user interaction; it provides a convenient venue for researchers to observe, extract, and analyze travelers' contextual information about their trips. Travel blogs from Ctrip were

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extracted as a dataset, meeting three screening criteria: (1) to assure the integrity of travel

blogs and present tourist safety perceptions through the whole process of tourism, and

blogger information on gender, destinations, and means of travel was required; (2) to

ensure the representativeness and content quality of selected blogs. Blogs with high

reading levels (more than 3,000 reads) ensured content quality and had enough attention;

and (3) were posted by genuine tourists and were not blogs sponsored and recommended

by websites and destinations. Thereby, 12 blogs of Chinese domestic travelers were

selected, including destinations such as Xinjiang, Fujian, Shanghai, Xi'an, Yunnan, and

Hainan, and 14 blogs of Chinese outbound travelers were selected, including destinations

such as Thailand, France, India, USA, and Australia. There were eight blogs written by

males and 18 blogs from females. These 26 blogs had a total of more than 300,000 words,

were posted online in 2012, and involved independent travel and group tours.

Additionally, the 26 blogs were coded independently, with C1-C21 for coding and

C22-C26 for saturation testing (Table 3).

[Insert Table 3 about here]

Using NVivo-11, the second initial item pool was developed through the three steps

of coding, refinement, and generation. Words, phrases, and sentences that reflected TPSD

were coded and labeled. An initial coding set with 194 labels was developed after

cross-checking with the literature and labels. In the refinement step, the initial coding set

was simplified, classified, and integrated according to the proposed TPSD dimensions

(human, facility and equipment, natural environment, social-cultural context, and

management), thereby forming normative concepts that reflected safety perceptions. In the generation step, the normative concepts were re-simplified, re-classified, and re-integrated, and corresponding measurement items of TPSD were developed. During the refinement and generation steps, two researchers, one with a research background in tourism safety and the other familiar with content analysis, independently read and checked the process of coding refinement and item generation. The consistency rate in coding refinement and transcription was 90%. Finally, the coding set of 194 labels was narrowed down to 21 normative concepts, and 16 new items were generated and added to the first item pool (Table 5). The results of the content analysis added five additional themes to the results of the literature review (natural disasters, political instability, other tourists, and convenience and comfort, Table 4). After the content analysis of the blogs of C21-C26, no new insights were found compared with the previous 21, implying the saturation of the results of the content analysis.

[Insert Table 4 and Table 5 about here]

Content Validity

The content validity of initial items was assessed in three steps (Table 6). First, an expert panel of three tourism researchers and two senior tour guides independently identified and classified the items with similar measurement scenarios or connotations. The three researchers had more than five years of research experience in tourism safety and destination marketing, and the two senior tour guides had more than five years of industry working experience. Based on the agreement of all experts, 27 items with similar

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connotations were combined into 11 items (e.g., a first aid kit in a hotel room; a flashlight

in a hotel room). Second, the remaining 28 items were sorted. According to the realities

that Chinese tourists might encounter at destinations, three experts independently sorted

the items on each dimension. Three items with relatively low probabilities were excluded

(e.g., using public transport is safe) and at least five items for each dimension were

guaranteed. Third, the communication quality of each item was optimized. In order for

tourists to better understand the items, two experts (one Chinese professor and one British

professor) optimized the expressions of items, and seven items were revised without

greatly modifying their meanings (e.g., has good infrastructure (communication service,

etc.). A pilot test was conducted to assess the effectiveness of item expressions in Fujian

Province. In short interviews with 100 respondents after completing questionnaires, no

obvious problems and misunderstandings were identified. Finally, 25 initial items were

generated and grouped into the five dimensions, with five items for each dimension.

[Insert Table 6 about here]

Stage 2: Scale Refinement

The purpose of stage 2 was to purify and refine the items generated in stage 1. Through

convenience sampling, data were collected at five popular tourist sites, namely Overseas

Chinese Town (Shenzhen), Chimelong Tourist Resort (Guangzhou), Yuntai Mountain

(Jiaozuo), Longmen Grottoes (Luoyang), and Qingming Riverside Landscape Garden

(Kaifeng). The questionnaires were delivered in a one-to-one format (one respondent and

one researcher) and collected on-site to ensure data validity. Respondents were informed

about the research purpose and anonymity of answers was assured. They rated each item

on five-point Likert scales ranging from one (strongly disagree) to five (strongly agree).

A total of 350 questionnaires were handed out and 300 valid copies were obtained,

representing a valid response rate of 85.7%. The demographic profile of respondents is

reported in Table 7.

The internal reliability of the TPSD scale was examined using SPSS 22.0. The

item-to-total correlation (ITTC) was computed to identify the reliability of each item, and

the results showed that the ITTC of each item was greater than the recommended value of

0.5 (Bagozzi, 1981). Also, the Cronbach's alpha for each construct surpassed the 0.7

threshold, indicating the acceptable reliability of the TPSD scale and its dimensions

(Guilford, 1965).

[Insert Table 7 about here]

An explanatory factor analysis (EFA) with principal component analysis and

Varimax rotation was conducted. The Kaiser-Meyer-Olkin index was 0.925 (> 0.7) and

the Bartlett spherical test was significant at the level of 0.001, which justified the use of

EFA. After seven iterations, five factors with eigenvalues greater than one were extracted,

and the cumulative variance contribution was 66.3%. According to Straub's (1989)

suggestions, two items with factor loadings below 0.5 were eliminated (PSNE-01;

PSNE-02), and the EFA was performed with the remaining 23 items. Finally, five factors

were extracted, and both the factor loadings and communities of each item surpassed the

cut-off value of 0.5, accounting for 68.5% of total variance (Table 8).

[Insert Table 8 about here]

Stage 3: Scale Validation

Reliability and Validity Assessment

Confirmatory factor analysis (CFA) in stage 3 was performed to re-examine the factor

structure produced from stage 2, and to verify the convergent and discriminant validity of

the TPSD scale. The cross-validity and criterion-related validity of the scale were also

examined. In order to improve the representativeness of the sample, stage 3 collected data

from the main geographical areas of eastern (Fujian, Taiwan and Zhejiang), northern

(Shanxi), central (Hunan), southern (Hong Kong and Macao), southwest (Yunnan and

Chongqing), northwest (Inner Mongolia, Shanxi and Ningxia) and northeast (Jilin)

regions of China in three time periods. Undergraduate students were employed to deliver

questionnaires through convenience sampling in 4A- and 5A-rated tourist attractions

during the three summer vacations of 2013, 2015, and 2017. Each undergraduate student

was trained to fully understand the research purpose, target groups and anonymity

conditions. Also, the questionnaires were required to be delivered in a one-to-one format

(one respondent and one researcher) and collected on-site. Eventually, 1,000

questionnaires were distributed in August 2013; 500 questionnaires in August 2015; and

500 questionnaires in August 2017. A total of 2,000 questionnaires were handed out and

1,830 valid responses from 34 provinces of China were obtained, representing an overall

valid response rate of 91.5%. The demographic profile of the respondents is in Table 7.

To avoid the self-validation concern, the sample was randomly split into two

915-case subsamples before performing the CFA. One sample was a calibration sample

for modifying the model, while the other was a validation sample for retesting the model.

CFA with maximum-likelihood analysis (ML) and the calibration sample was performed

using AMOS 22.0 to assess the overall fit of the model. The Cronbach's alpha of each

dimension ranged from 0.758 to 0.836, implying good reliability of the TPSD scale. To

achieve construct validity, the convergent, discriminant, and nomological validities need

to be considered. For convergent validation, closely following the guidance of Bagozzi

(1981) and Hair, Anderson, Tatham, and Black (2010), the goodness-of-fit-indices of the

model were adjusted with the following criteria: (1) the standardized factor loadings of

each item surpassed 0.5 and were statistically significant at the level of 0.05; (2) the

composite reliability (CR) of each dimension exceeded the recommended 0.7 threshold;

and (3) the average variance extracted (AVE) of each dimension was above the cut-off

value of 0.5. With the model modification indices, three items (PSH-0.5, PSFE-04,

PSM-01) were eliminated to achieve a better factor structure (χ^2 = 627.969, df = 160, χ^2/df

= 3.925, p = 0.000, GFI = 0.933, RMR = 0.034, RMSEA= 0.057, NFI = 0.922, CFI =

0.940, and AGFI = 0.912).

[Insert Table 9 about here]

For discriminant validity, the correlation coefficients between constructs should be

less than 0.85 and should be lower than the square root of the average extracted variances

(AVEs) of each construct. Table 10 shows that each construct satisfied this requirement,

implying a strong discriminant validity of the TPSD scale (Kam and Petrick, 2010). As

indicated by the correlation matrix (Table 10), the five constructs of the TPSD scale were

all correlated at the significance level of 0.01, which confirmed the predictability of each

construct at the theoretical level and demonstrated nomological validity.

[Insert Table 10 about here]

Model Comparison of TPSD

Four competitive models were constructed with the validation sample to identify the

optimal factor structure for TPSD (Figure 2). Model 1 was a one first-order factor model

with 20 items (Figure 2-1); model 2 was a five first-order factor model without

correlation (Figure 2-2); model 3 was a five first-order factor model with correlation

(Figure 2-3), and model 4 was a one second-order factor model with five first-order

factors (Figure 2-4).

As shown in Table 11, the goodness-of-fit of model 1 and model 2 did not meet the

recommended level, implying that both model 1 and model 2 were not the optimal

measurement structure for TPSD. Additionally, model 3 and model 4 showed better

goodness-of-fit than model 1 and model 2, and the two models also demonstrated

satisfactory fit. However, model 3 was superior to model 4. In model 4, the loadings of

the initial five factors (PSH, PSFE, PSNE, PSSE, PSM) on the second order TPSD were

0.751, 0.816, 0.682, 0.760, and 0.765, which exceeded the recommended 0.5 threshold

and were statistically significant at the level of 0.01. This dimensionality test suggested

that model 3 was the optimal factor structure for TPSD (Figure 2-3) and supported the

use of a second-order measurement structure for TPSD as well (Figure 2-4).

[Insert Table 11 and Figure 2 about here]

Cross Validity

An invariance test was employed to assess the cross-validity of the TPSD scale. An invariance test across randomly selected groups (50% vs. 50%) was performed. Table 12 shows that the baseline model for the unconstrained model and the factor loading constrained model indicated a satisfactory overall fit and the same construct was measured across specified groups. The result of the chi-square difference test between the randomly selected samples was invariant ($\Delta\chi^2(\Delta df=15) =16.311$, $p = 0.362 > 0.05$). These aforementioned results determined that the measurement model was invariant across different groups, and the cross-validity of the five-dimensional structure of the TPSD scale was confirmed as well.

[Insert Table 12 about here]

Criterion Validity

The criterion validity of the TPSD scale can be confirmed by the correlation with relevant scales. George's (2003) scale of tourist perceptions of safety and security (TPSS) and Edmondson's (1999) scale of psychological safety (PS) were most influential measurements in relation to the TPSD. Thus, seven items measuring TPSS adapted from George (2003), and six items measuring PS adapted from Edmondson (1999) were included in the questionnaire together with the developed TPSD scale. Each item was anchored on a Likert five-point scale, ranging from one (strongly disagree) to five (strongly agree) based on travel experiences. As shown in Table 13, the Cronbach's alpha

values of TPSS and PS surpassed the cut-off value of 0.7, and TPSD and its dimensions were found to be positively correlated with TPSS and PS. Also, the correlation coefficients between TPSD (second order) and TPSS and PS were stronger than their dimensions. Thus, the criterion-related validity of the TPSD scale was verified.

[Insert Table 13 about here]

Conclusions and Implications

Conclusions

Strictly following the procedures proposed by Churchill (1979), this research provides a reliable conceptualization and valid scale for TPSD based on safety system theory. A three-stage study was conducted and a 20-item, five-dimension (PSH, PSFE, PSNE, PSSE, PSM) TPSD scale received support. The TPSD scale passed a reliability test, EFA and CFA, and confirmed that the measurement model proposed for TPSD was applicable to a first-order factor as well as a second-order factor model. Additionally, the convergent, discriminant, nomological, cross, and criterion validities were confirmed.

The results indicated that there were dimensional differences in the perceived level of destination safety among Chinese tourists. According to Table 9, PSH (mean = 3.76) and PSFE (mean = 3.82) were relatively high and included the major high-scoring items (PSFE-03, 05; PSH-03, 04), and PSNE (mean = 3.65) and PSSE (mean = 3.56) were relatively low and covered major low-scoring items (PSNE-04, 05; PSSE-01, 02, 03). Additionally, the loadings of the initial five factors (PSH, PSFE, PSNE, PSSE, and PSM) on the second order TPSD were 0.751, 0.816, 0.682, 0.760, and 0.765, implying the

category differences in the TPSD of Chinese tourists.

Theoretical implications

First, the current study compensates for the deficit in the existing literature by conceptualizing and verifying TPSD as a multi-dimensional construct based on safety system theory. Safety is a basic need of tourists and it is also recognized as being a fundamental condition for the sustainable development of destinations. Previous studies have investigated and measured TPSD in the contexts of crime, roads, safety and security measures (Wilks et al., 1999; Choocharukul and Sriroongvikrai, 2017; Rittichainuwat and Chakraborty, 2002; George, 2003; 2010), and may have a certain degree of measurement bias. Tourist personal assessments of safety elements and information at destinations constitute TPSD (Seabra et al., 2013). Obviously, this element varies in nature, type, and source, and thus it is imperative to explore the conceptualization and measurement structure of TPSD from a systems structure perspective. Accordingly, the conceptualization and hierarchical level sources of TPSD (human, facility and equipment, environment, and management) were identified based on safety system theory and the 4M analysis framework, which provide clearly structured and inclusive dimensions of perceived safety for tourism research.

Second, this research proposes that TPSD can be regarded as tourist perceptions of the "travel safety system" and it integrates assessments of the risk-induced factors of the accident system and the elements of the safety system. This research is the first occasion for safety system theory to be applied to measure tourist safety perceptions. Specifically,

the 4Ms are the basic risk factors and safety elements in safety and accident systems, and

the 4M analysis framework uncovers the structure that underlines the safety perceptions

and experiences of tourists from a risk-source perspective, as well as representing safety

perception structures at destinations (Bentley et al., 200; Page et al., 2005; Xie et al.,

2020). According to the literature review and risk situations faced by tourists, the

environmental elements perceived by them can be subdivided into natural and

social-cultural environmental safety dimensions (Scott and Lemieux, 2010; Freitas, 2010;

Mansfeld et al, 2004; Pizam and Smith, 2000; Sönmez and Graefe, 1998; Jenkin, 2006).

The results showed that the human and facility elements were of greatest concern, while

the natural and social elements had lesser scores in the TPSD system, which reflects the

differing evaluations of tourists of safety at destinations. Therefore, this research expands

the concept of environments in safety system theory and the 4M analysis framework and

provides new insights into the effects of diverse elements during the formation of TPSD.

Third, the new scale advances the knowledge of TPSD by providing a reliable and

valid measurement tool for follow-up empirical research. The measurement of TPSD has

received much attention by academic scholars, and various measurement structures of

TPSD have been proposed. This TPSD scale is rooted in safety system theory and the 4M

analysis framework, which assures that measurements are systematic, hierarchical, and

universal. The TPSD scale covers various types of safety elements that may affect tourist

safety assessments, which include some of the dimensions of TPSD, for example that of

safety elements from the environmental level such as crime (George, 2003; 2010), and

natural disasters (Rittichainuwat, 2013). The safety elements from the facility and equipment level such as security equipment (Rittichainuwat and Chakraborty, 2002) are scattered across previous research. Safety elements from human and management levels have rarely been discussed in tourism research. Compared with previous scales, the newly proposed TPSD scale embeds tourist safety assessments in the generalized travel context and with a location orientation. Multiple subjects, varied elements, and diverse situations to which tourists may be exposed were taken into consideration to systematically measure the safety perception structure of tourists.

Practical Implications

This research has several practical implications. First, destination management organizations (DMOs) should use the TPSD scale for a better understanding of safety perceptions, and subsequently for developing tailored strategies to maintain a safe destination environment for tourists based on each specific dimension. For example, DMOs should incorporate the behavior of tour guides, residents, tourism operators, and even the tourists themselves into the scope of human safety management. DMOs should enhance the comprehensive management of facilities and equipment, particularly in the context of consumption and recreation. The regular inspection of performance, convenience, and availability of facilities and equipment should be guaranteed as well. DMOs should divide the environmental safety system into two sub-components (natural environment and social-cultural contexts) to improve the professionalism of natural and social environmental safety management. For management safety elements, DMOs

should pay attention to the development of professional safety programs and strengthen the preparation of crisis management plans, security work, safety resources, and safety culture at the destination level. Additionally, DMOs should strengthen the interaction between tourists and these safety elements, thereby enhancing the travel and safety confidence of people in unfamiliar environments.

Second, the scale can be used to assess the perceived safety levels of tourists, and thus become a benchmark for DMOs for image and crisis management. The scale can be used as a diagnostic tool to continuously monitor changes in tourist safety perception levels and provide decision support for optimizing destination safety image management practices. Even after a crisis, the scale need not only be used to identify the elements that influenced tourist safety assessments, but also clearly will reflect the effectiveness of destination safety management in crisis situations, thereby guiding the inclusion of further tailored measures and services. In addition, DMOs should categorize crisis situations and based on the dimensional and element differences in tourist safety perceptions after crisis events. DMOs should establish an information intervention system for major information channels for tourists during a crisis and reduce the negative impacts through the emergency responses of multiple subjects, such as local governments, residents, tourism operators, and tourists.

Third, this research also indicates that the scores of Chinese tourists on PSFE (Mean = 3.82), PSH (Mean = 3.76), PSM (Mean = 3.75), PSNE (Mean = 3.65), and PSSE (Mean = 3.56) decreased in order, and the scores on environmental safety perception

were the lowest. These results show that DMOs in China should improve the safety

knowledge and skills of tour guides. Also, DMOs in China should promote the reliability

of facilities and equipment in operations, as well as provide enough safety equipment. It

is of great concern that tourist safety perceptions of natural and social-cultural

environments are low. DMOs in China should not only mitigate the negative impact on

TPSD of natural disasters, but also strictly address the social-cultural issues such as

overcrowding, scams and frauds, theft, violence, and forced shopping.

Limitations and Directions for Future Research

The current research has some limitations that may be remedied by future studies. First,

although safety system theory provides clearly structured and inclusive dimensions of

TPSD, this theory was developed in a non-travel context. Thus, safety system theory

cannot capture the essential essence of tourism, such as movement, unfamiliar

environments, and the TPSD items developed are frequently connected to accidents and

perceptions of tourist safety. Future research should adopt diverse theoretical perspectives,

especially those closely related to tourism to confirm and optimize the TPSD scale.

Second, some items developed may not be universal enough, and the items related to the

PSFE dimension may seem somewhat unclear. Thus, future refinement of the TPSD scale

items is warranted. Third, the measurement structure of TPSD was developed only for

Chinese tourists, and tourists with different cultural backgrounds may have different

understandings of some items. To ensure the universality of the TPSD scale, future

research should expand sample sizes and explore TPSD in different cultural contexts.

Fourth, the data were collected through convenience sampling. Since the survey was

conducted during summer vacations, youth/students accounted for a large proportion of

the whole sample. Tourist characteristics, such as age and occupation, have an impact on

perceived safety. Future studies should validate the TPSD scale with different research

designs and samples, as well as investigating the effect of tourist characteristics (e.g., age,

occupation) on TPSD. Fifth, the criterion validity of the TPSD scale was confirmed by

the correlations with the relevant scales of George (2003) and Edmondson (1999). The

antecedents (e.g., destination image, destination safety atmosphere) and consequences

(e.g., tourist satisfaction, safety behavior, revisit intention) of TPSD should be

investigated in future studies.

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Table 1. Generation of item pool for measuring TPSD

Steps	Purposes	Methods	Outcomes
Step 1	Develop initial items	Literature review	First initial pool: 29 items
Step 2	Open code: extract the statements containing TPSD from tourist blogs	1. Content analysis (NVivo11)	Develop an initial coding set
Step 3	Refine and classify the coding set	2. Cross-checking	Generate final codes
Step 4	Code the statements into initial items	3. Literature review	Second initial pool: 16 items
Step 5	Refine items for content validity	Expert assessment	Final initial pool: 25 items

Table 2. Dimensions and initial items of TPSD

Dimensions	Themes	Original Items	Reference (before 2012)	Reference (similar items after 2012)
PSH	Tour guide	The tour leader has a professional ability The tour leader shows friendliness	Wang et al. (2007)	Caber and Albayrak（2016）
	Tourism operator	Put a lot of effort into job try to satisfy customers.	Peccei and Rosenthal (2000)	
	Resident	Hospitable and friendly people	Chen and Tsai (2007)	Akgün, Senturk, Keskin, Onal, (2019)
		Local people are friendly	Echtner and Ritchie (1993)	
PSFE	Fully-equipped	A first aid kit in hotel room A flashlight in hotel room	Rittichainuwat and Chakrabort (2012)	Rittichainuwat (2013)
	Professional facility	A facemask for each guest for smoke, disease Walk-in metal detector at the hotel Continuing airport temperature/thermal check	Rittichainuwat and Chakrabort (2012)	
	Good quality	Has a good infrastructure (communication service, etc.)	Hosany, Ekinci and Uysal (2007)	Akgün, Senturk, Keskin, Onal, (2019)
		Safety of the coach is reliable	Wang et al. (2007)	
PSNE	Weather	Good weather/pleasant weather	Chen and Tsai (2007); Echtner and Ritchie (1993)	
	Landscape	Spectacular landscape	Chen and Tsai (2007); Hosany, Ekinci and Uysal (2007)	
PSSE	Transportation	Driving around city is safe Local transport engaged to visit tourist places	George（2003; 2010）Chauhan（2007）	Lee et al. (2018); Akgün, Senturk, Keskin, Onal, (2019) Caber and Albayrak（2016）
	Sanitation	Local standard of cleanliness and hygiene are high	Echtner and Ritchie (1993)	
	Consumption safety	Shopping shores have good reputation	Wang et al. (2007)	
		A good shopping place	Chen and Tsai (2007)	
	Public safety	Walking streets after dark is safe Using public transport is safe	George（2003; 2010）	
		Performing leisure activities such as shopping, adventure, roaming and photography is safe	Chauhan（2007）	
PSM	Emergency plan Emergency evacuation	A crisis management plan of service providers Rehearsal of evacuation plan for emergency	Rittichainuwat and Chakrabort (2012)	Rittichainuwat (2013)
	Warning system	Tsunami warning system on beaches Evacuation warning system linked to guest room	Rittichainuwat and Chakrabort (2012)	
	Safety communication	Good tourist information is really available	Echtner and Ritchie (1993)	Amir et al.（2015）；Lee et al. (2018)
	Police capability	The police do their job well Police officers attempt to maintain a safe environment	Maguire and Johnson (2010)	Tyagi et al.(2016)

Note: The first initial item pool was developed and generated in 2012.

Table 3. Travel blog sample profile

No.	Gender	Travel group	Title	Destination	No.	Gender	Travel group	Title	Destination
C1	Male	Alone	*Miles to go alone*	China	C14	Female	Couples	*Maldives trip*	Maldives
C2	Male	Alone	*Incredible Indian scenery*	India	C15	Female	Couples	*Independent travel in North India in New year*	India
C3	Female	Alone	*Into Shanghai*	China	C16	Female	Alone	*Yunnan Impressions*	China
C4	Female	With family	*Travel to Europe with Mom*	France	C17	Male	With friend	*A deep tour in Yunnan*	China
C5	Female	Tour group	*"Silk Road" Group Tour*	China	C18	Female	With family	*7200 kilometers in 28 days*	China
C6	Male	Alone	*Fly to South Africa to see the world*	South Africa	C19	Female	With friend	*Travel Guide in 2012*	China
C7	Male	Tour group	*Paradise on Hawaii*	USA	C20	Female	With family	*Travel in Xi'an*	China
C8	Female	Tour group	*Tips for United States Tour*	USA	C21	Female	Tour group	*8 days of Spring Festival tour in Egypt*	Egypt
C9	Male	Alone	Bangkok, Thailand	Thailand	C22	Female	With friend	*Eden on earth in 2012*	Europe
C10	Female	With family	*3500 km self-driving tour in Thailand*	Thailand	C23	Female	With friend	*Heaven of light and shadow – Kapalai*	Malaysia
C11	Female	Tour group	*6 days and 5 nights (Tokyo, Nagoya, Nara, Kyoto, Osaka, Japan)*	Japan	C24	Male	Alone	*Travel in Sanya*	China
C12	Female	With family	*A independent tour of Australia*	Australia	C25	Female	With friend	*Visiting Dai Temple in the off-season*	China
C13	Female	With friend	*Self-driving tour on New Zealand South Island*	New Zealand	C26	Female	With friend	*Searching for Food in Xiamen in March*	China

Note: C1-C21 for coding, and C22-C26 saturation test.

Table 4. Themes of tourist perceived safety of destinations

Dimensions	Themes	Percentage		Dimension	Theme	Percentage	
PSH	Tour guide	1.5%		PSSE	Transportation	9.2%	
	Tourism operator	6.7%	13.9%		Sanitation	5.1%	39.6%
	Resident	4.1%			Public safety	11.8%	
	Other tourists	**1.5%**			Consumption safety	10.8%	
PSFE	Fully equipped	1.5%			**Political instability**	**2.5%**	
	Professional facility	0.5%	5.6%		**Safety inspection**	**1.5%**	
	Good quality	2.5%			Warning system	0.5%	
	Convenient and comfortable	1.0%		PSM	Safety communication	2.0%	6.1%
PSNE	Weather	9.7%					
	Landscape	18.0%	34.5%				
	Sightseeing environment	6.1%			Police capability	2.0%	
	Disaster	**0.5%**					

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Table 5. Second initial item pool for TPSD generated from content analysis

Items	Sample coded statement
PSH	
Other tourists I met during the tour show friendliness to me	"On the way from Yajiang to Litang, our car fell into the mud three times. And people in the same car helped us twice, including push the car and lending us ropes. Many thanks to them." (C18-1-1)
Tourism practitioners has a professional safety ability	"There are full-time doctors, bellmen, pianists, masseurs and other servants in the car, and their service is very professional." (C5-1-2)
PSFE	
I didn't encounter any danger when using the facility	"There are 3 million cars in Cairo. And no matter how old the car is, it can be driven on forever because there is no motor vehicle retirement system in Egypt." (C21-2-1)
The destination facility feels comfortable to use	"Cars in India are very slow. The seats on the car are crowded and the distance between the front and rear is small. Fortunately, I was sitting in the first row, not so hard." (C2-2-2)
The destination facility is used without failure	"The car stop-and-go along the crowded and noisy road. We also saw very old trams." (C21-2-3)
PSNE	
The destination is less prone to natural disasters	"The flame of the lighthouse shines through the entire Alexandria port and burned for nearly a thousand years before being destroyed by the earthquake." (C21-3-1)
The destination's natural environment is clean and tidy	"Several small courtyards are very elegant. The scenery of the Jiangnan gardens is very good, and the rubbings written by celebrities are scattered throughout. Also, the environment is quiet and elegant, making people forget to return." (C1-3-2)
There are no safety hazards in the natural environment of the destination	"The yellow shoal looks dry and seems to be quite solid. But after a while, it became soft. I turned and wanted to quit, but suddenly my body quickly fell and reached the knee." (C1-3-3)
PSSE	
I rarely encounter political conflicts at the destination	"Egypt's protests on January 25, 2011 caused me to worry, and the situation has been chaotic." (C21-4-1)
I rarely encounter forced consumption at the destination	"Many merchants suddenly rushed up and surrounded us. A merchant put a white Arab headscarf in my hand and said: "China, no money, no money". Then, the second merchant took my hat and forced the headscarf to wear on the head. The third merchant wanted to grab the camera and took pictures for me. Finally, the fourth began to ask for money." (C21-4-2)
I rarely encounter fraud at the destination	"They must be colluding. The people who agreed with us last night hid, and others came out and scammed our money as much as possible." (C15-4-3)
I rarely encounter overcrowded and messy conditions at the destination	"The ceremony of the Ganges Sacrifice has not yet begun, but the venue has been crowded with people. We are here at 5 o'clock." (C21-4-4)
I rarely encounter violence at the destination, such as fighting	"In addition to the lively night scenery and night market, it is best not to go out at night. I heard about the news of robbery or even murder at night." (C10-4-5)
PSM	
I can see warning sign about security at the destination	"The roads in New Zealand are very flat, even in the NATIONAL PARK, the safety signs are very clear. And won't get lost." (C13-5-1)
Tourism enterprises provide tourists with safety information	"Free means that the service facilities in the scenic area may not be complete, and it will not remind you of security issues. And security issues can only be noticed by yourself." (C10-5-2)
Rigorous safety inspection are carried out at the tourist destination	"The security check at the destination is very strict and you can see the soldiers with guns." (C15-5-3)

Note: C18-1-1 represents the 18th tourists' blog, which is sorted into the first item of the first dimension.

Table 6. Results of content validity testing

	Initial item pool	Initial item pool with content validity
PSH	The tour leader has a professional ability (L)	PHS-01. Tour guides can take care of me safety
	Tourism practitioners has a professional safety ability (G)	PHS-02. Tourism practitioners has a professional safety ability
	Put a lot of effort into job try to satisfy customers (L)	PHS-03. Tourism practitioners can provide service safely
	Local people are friendly (L)	PHS-04. Local people are friendly
	The tour leader shows friendliness (L); Hospitable and friendly people (L); Other tourists I met during the tour show friendliness (G)	PHS-05. The people I met during the tour show friendliness to me
PSFE	Has a good infrastructure (communication service, etc.) (L)	PSFE-01. The destination facility is reliable in performance
	A first aid kit in hotel room (L); A flash light in hotel room (L); A face mask for each guest for smoke, disease (L); Walk-in metal detector at the hotel (L); Continuing airport temperature/thermal check (L)	PSFE-02. The destination facility looks safe and secure
	Local transport engaged to visit tourist places (L); The destination facility feels comfortable to use (G)	PSFE-03. The destination facility feels convenient to use
	Safety of the coach is reliable (L); The destination facility is used without failure (G)	PSFE-04. The destination facility is used without failure
	I didn't encounter any danger when using the facility (G)	PSFE-05. I didn't encounter any danger when using the facility
PSNE	Spectacular landscape (L)	PNES-01. The quality of the natural environment of destination is favored by tourists.
	The destination's natural environment is clean and tidy (G)	PNES-02. The destination's natural environment is clean and tidy
	There are no safety hazards in the natural environment of the destination (G)	PNES-03. There are no safety hazards in the natural environment of the destination
	The destination is less prone to natural disasters (G)	PNES-04. The destination is less prone to natural disasters
	Good weather/pleasant weather (L)	PNES-05. There is no need to worry about extreme natural conditions at the destination, such as weather.
PSSE	I rarely encounter overcrowded and messy conditions at the destination (G)	PSES-01. I rarely encounter overcrowded and messy conditions at the destination
	Performing leisure activities such as shopping, adventure, roaming and photography is safe (L); I rarely encounter forced consumption at the destination (G)	PSES-02. I rarely encounter forced consumption at the destination
	Shopping shores have good reputation (L); A good shopping place (L); I rarely encounter fraud at the destination (G)	PSES-03. I rarely encounter fraud and theft at the destination
	I rarely encounter violence at the destination, such as fighting (G)	PSES-04. I rarely encounter violence at the destination, such as fighting
	Walking streets after dark is safe (L); Driving around city is safe (L)	PSES-05. I rarely encounter public security problems at the destination
	Using public transport is safe (L); Local standard of cleanliness and hygiene are high (L); I rarely encounter political conflicts at the destination (G)	Item with low possibility were deleted
PSM	I can see warning sign about security at the destination (G)	PMS-01. I can see warning sign about security at the destination
	Good tourist information is really available (L)	PMS-02. I can receive the safety information provided by the destination.
	The police do their job well (L); Police officers attempt to maintain a safe environment for tourists (L); Rigorous safety inspection are carried out at the tourist destination (G)	PMS-03. The security work of the destination is very effective.
	Tsunami warning system on beaches (L); Evacuation warning system linked to guest room (L)	PMS-04. The safety construction of the destination is good.
	A crisis management plan of service providers (L); Rehearsal of evacuation plan for emergency (L);	PMS-05. Amounts of resources are invested by the destination to protect tourists' safety

Tourism enterprises provide tourists with safety
information (G)

Note: L represents the item generate from literature, and G represents the item generate from content analysis.

Table 7. Respondent profile

Variable	Category	Study 2 (n = 300)		Study 3 (n = 1,830)	
		Frequency	Rate	Frequency	Rate
Gender	Male	146	48.7%	836	45.68%
	Female	154	51.3%	994	54.32%
Age	≤17	13	4.3%	102	5.57%
	18-24	170	56.7%	692	37.81%
	25-34	78	26.0%	520	28.42%
	35-44	26	8.7%	315	17.21%
	45-64	10	3.3%	159	8.69%
	≥65	3	1.0%	42	2.30%
Education	Senior middle school and below	60	20.0%	441	24.10%
	Technical secondary school	55	18.3%	452	24.70%
	Undergraduate	164	54.7%	820	44.81%
	Graduate and above	21	7.0%	117	6.39%
Occupation	Staff	56	18.7%	289	15.79%
	Government official	18	6.0%	106	5.79%
	Researcher	9	3.0%	137	7.49%
	Self-employed	15	5.0%	161	8.80%
	Soldier	6	2.0%	16	0.87%
	Student	140	46.7%	617	33.72%
	Professionals and technical	9	3.0%	92	5.03%
	Freelance	16	5.3%	174	9.51%
	Retired	4	1.3%	86	4.70%
	Other	27	9.0%	152	8.31%
Monthly income	Below 1999 RMB	160	53.5%	700	38.25%
	2000-4999 RMB	96	32.0%	692	37.81%
	5000-7999 RMB	28	9.3%	275	15.03%
	8000-9999 RMB	8	2.7%	81	4.43%
	Above 10000 RMB	8	2.7%	82	4.48%
Travel frequency	Hardly	20	53.3%	152	8.31%
	Seldom	92	32.0%	598	32.68%
	Sometime	112	9.3%	657	35.90%
	Often	68	2.3%	375	20.49%
	Usually	8	3.1%	48	2.62%

Table 8. Results of EFA

Dimension and Item Description	Study 2 (n = 300)			
	Mean	SD	Factor loadings	Variance
Factor 1: PSH (5 items, Cronbach'α = 0.862)				
PSH-01	3.40	0.87	0.688	
PSH-02	3.51	0.88	0.806	
PSH-03	3.63	0.81	0.704	14.054%
PSH-04	3.75	0.85	0.654	
PSH-05	3.71	0.84	0.655	
Factor 2: PSFE (5 items, Cronbach'α = 0.882)				
PSFE-01	3.55	0.84	0.710	
PSFE-02	3.63	0.81	0.680	
PSFE-03	3.61	0.83	0.707	14.556%
PSFE-04	3.79	0.88	0.668	
PSFE-05	3.91	0.86	0.630	
Factor 3: PSNE (3 items, Cronbach'α = 0.865)				
PSNE-03	3.43	0.94	0.697	
PSNE-04	3.38	0.96	0.805	11.242%
PSNE-05	3.37	1.04	0.846	
Factor 4: PSSE (5 items, Cronbach'α = 0.871)				
PSSE-01	3.03	1.04	0.704	
PSSE-02	3.40	1.05	0.780	
PSSE-03	3.14	1.13	0.767	14.894%
PSSE-04	3.63	0.90	0.692	
PSSE-05	3.66	0.92	0.673	
Factor 5: PSM (5 items, Cronbach'α = 0.852)				
PSM-01	3.88	0.89	0.739	
PSM-02	3.77	0.82	0.778	
PSM-03	3.56	0.78	0.713	13.789%
PSM-04	3.50	0.81	0.576	
PSM-05	3.59	0.80	0.640	

Table 9. Results of CFA

Dimensions	Study 3 (n1 = 915)				
	Mean	SD	Standardized Factor Loadings	CR	AVE
PSH (4 items, Cronbach' α = 0.811)					
PSH_01	3.59	0.93	0.733		
PSH_02	3.74	0.85	0.807	0.8196	0.5347
PSH_03	3.79	0.82	0.769		
PSH_04	3.92	0.86	0.599		
PSFE (4 items, Cronbach' α = 0.816)					
PSFE_01	3.72	0.88	0.796		
PSFE_02	3.76	0.82	0.776	0.8203	0.5350
PSFE_03	3.85	0.83	0.715		
PSFE_05	3.95	0.86	0.627		
PSNE (3 items, Cronbach'α = 0.758)					
PSNE_03	3.67	0.88	0.695		
PSNE_04	3.64	0.93	0.745	0.7599	0.5136
PSNE_05	3.65	0.96	0.709		
PSSE (5 items, Cronbach'α = 0.836)					
PSSE_01	3.22	1.10	0.609		
PSSE_02	3.53	1.01	0.717		
PSSE_03	3.48	1.02	0.727	0.8407	0.5152
PSSE_04	3.75	0.92	0.787		
PSSE_05	3.83	0.90	0.737		
PSM (4 items, Cronbach'α = 0.808)					
PSM_02	3.80	0.85	0.644		
PSM_03	3.74	0.82	0.742	0.8101	0.5170
PSM_04	3.69	0.84	0.742		
PSM_05	3.77	0.82	0.743		

Table 10. Correlations and square roots of AVE (n1 = 915)

Dimensions	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
Factor 1: PSH	(0.731)				
Factor 2: PSFE	0.573**	(0.731)			
Factor 3: PSNE	0.394**	0.441**	(0.717)		
Factor 4: PSSE	0.471**	0.542**	0.435**	(0.718)	
Factor 5: PSM	0.577**	0.524**	0.510**	0.438**	(0.719)

Note: 1. The diagonal element is the square root of the extracted mean variance; 2. The off-diagonal element are correlations between dimensions ($p<0.01$).

Table 11. Model comparison of TPSD (n2 = 915)

Goodness-fit-indices	Model 1	Model 2	Model 3	Model 4
RMSEA	0.130	0.107	0.054	0.055
RMR	0.115	0.213	0.034	0.038
CFI	0.654	0.766	0.945	0.940
NFI	0.641	0.750	0.926	0.920
TLI	0.616	0.739	0.935	0.931
IFI	0.655	0.767	0.945	0.940
GFI	0.740	0.777	0.938	0.933
AGFI	0.681	0.724	0.918	0.915

PGFI	0.603	0.629	0.714	0.733
χ^2	2822.250	1961.102	582.712	627.375
df	171	170	160	165
χ^2/df	16.504	11.536	3.642	3.802

Table 12. Results of cross validity test (n2 = 915)

	Measurement models	
	Random split (457 or 458)	
Goodness-fit-indices	Unconstrained	Measurement weights
RMSEA	0.040	0.039
RMR	0.037	0.040
CFI	0.940	0.940
NFI	0.903	0.901
TLI	0.928	0.931
IFI	0.940	0.940
GFI	0.920	0.918
AGFI	0.895	0.898
χ^2	785.024	801.336
df	320	335
χ^2/df	2.453	2.392

Table 13. Results of criterion-related validity (n1 = 915)

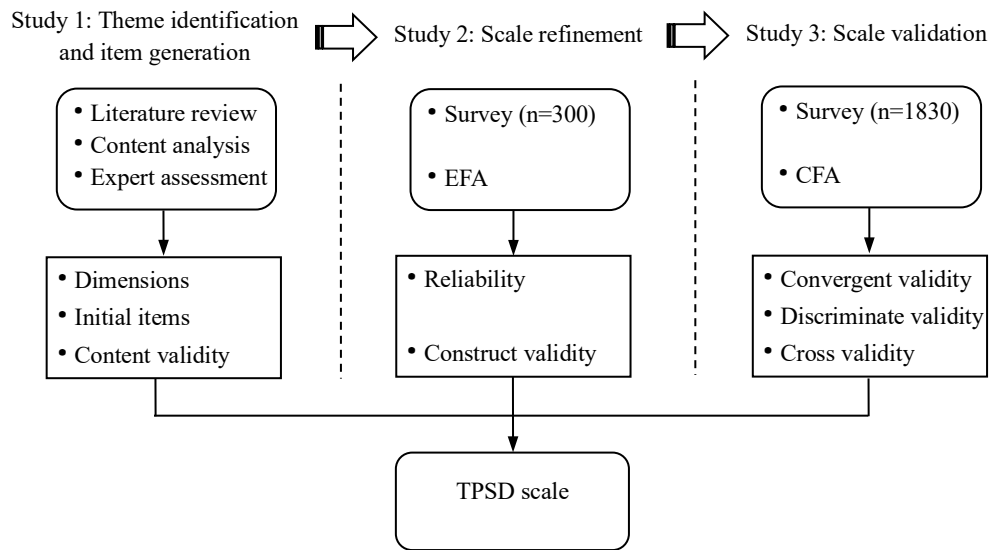|	TPSS (Cronbach's alpha = 0.826)	PS (Cronbach's alpha = 0.811)
PSH	0.492**	0.401**
PSFE	0.488**	0.290**
PSNE	0.426**	0.324**
PSSE	0.387**	0.379**
PSM	0.394**	0.391**
TPSD	0.566**	0.470**

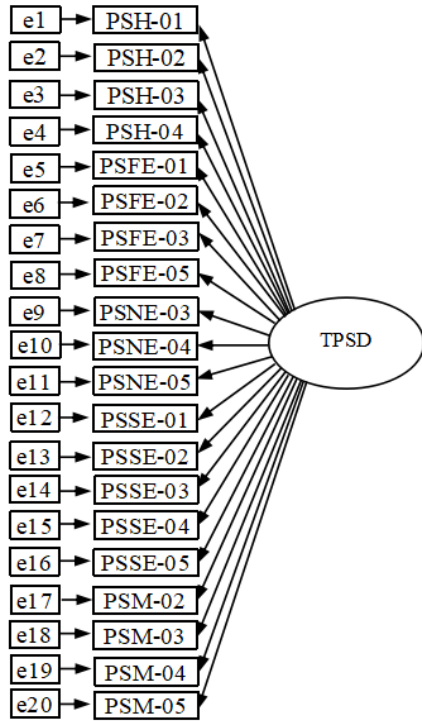Note:**$p<0.01$

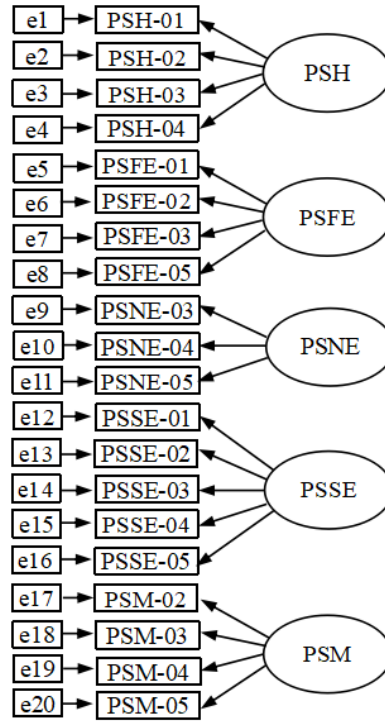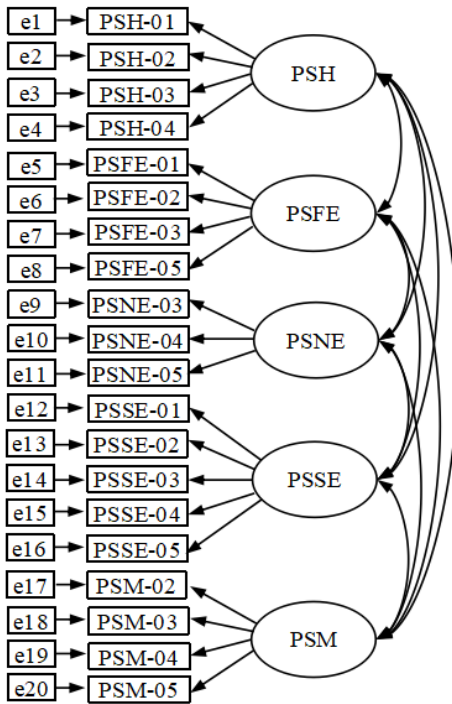**Fig.1.** Methodological procedure of scale development
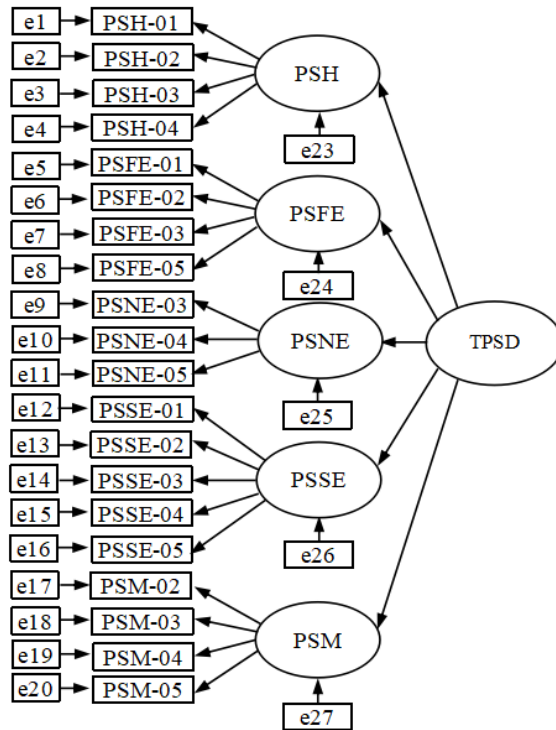
Figure 2-1

Figure 2-2

Figure 2-3

Figure 2-4

Fig. 2. Model comparison of TPSD