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Constraints to cruising across cultures and time

By

Kam Hung, PhD
Associate Professor
School of Hotel and Tourism Management
The Hong Kong Polytechnic University
Hong Kong SAR, China
Phone: (852)34002258
Email: kam.hung@polyu.edu.hk

Jin-Soo Lee, PhD
Associate Professor
School of Hotel and Tourism Management
The Hong Kong Polytechnic University
Hong Kong SAR, China
Phone: (852)34002238
Email: jinsoo.lee@polyu.edu.hk

Sha Wang, PhD (Corresponding Author)
Associate Professor
Department of Tourism
Fudan University
No. 220 Handan Road, Shanghai, China
Phone: (86)021-55665046
Email: shawang@fudan.edu.cn

and

James F. Petrick, PhD
Professor
Department of Recreation, Park and Tourism Sciences
Texas A&M University
United States

Email: j.petrick@tamu.edu

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Highlights:

- Cruise tourism is permeating the global arena.
- Constraints to cruising is essential for understanding travelers' decision-making.
- Cross-cultural approach was adopted to validate constraint measures.
- Data were collected in the U.S. in 2008 and 2017 and in China in 2017.
- Findings validated the cruising constraint instrument across time and cultures.

Constraints to cruising across cultures and time

Abstract: Cruise tourism is permeating the global arena. With companies developing new ships/itineraries for the U.S. and China markets, understanding constraints to cruising for different cultures carries significant value for cruise tourism development. This study adopted longitudinal and cross-cultural approaches to validate constraint measures. Data were collected in the U.S. in 2008 and 2017 and in China in 2017, using the same set of constraint measures across different times and cultures. This multi-dimensional triangulation approach was deemed important for testing the robustness of a measurement scale and is believed to be the first of its type. Findings validate the cruising constraint instrument across time and cultures and provide theoretical and practical implications.

Keywords: Cruising constraints; longitudinal; cross-cultural; China; U.S.

1. Introduction

Cruise tourism experienced stable growth from 1990 to 2019 with an average annual 6.6% increase in the total number of passengers (Cruise Market Watch, not dated). While initial demand for cruising was primarily from North America, subsequently Europe and the rest of the world, especially China, have gained an increasing share of the market (CLIA, 2016a). Although cruise development in Hong Kong has a long history, mainland China was barely a cruise destination just over a decade ago (Wang, Wang, & Xia, 2010). The year 2006 is often cited as the starting point for cruise development in mainland China, featuring the establishment of the first home port in Shanghai. Cruise demand in mainland China has expanded rapidly since 2010 (Sun, Feng, & Gauri, 2014). According to CLIA (2018a), Chinese cruise travelers accounted for 9.3% of all global passenger volume in 2017, positioning China (excluding Hong Kong) as the second-largest cruise industry source market in the world. This study focuses on mainland China rather than Greater China for two reasons. First, Hong Kong is commonly regarded in the cruise industry as a separate market from mainland China despite being a Special Administrative Region of China. This difference is widely acknowledged in the cruise industry as evidenced by the independent category of "mainland China" in various cruise reports. Second, Hong Kong is largely distinct from mainland China given its one-country-two-system policy and the two areas' unique historical and cultural backgrounds. Mixing data from two culturally different regions may muddy our views on this topic. As this study focuses solely in mainland China, the term "China" is henceforth used to refer specifically to the mainland.

In a survey of cruise travelers in North America in 2014, cruisers cited cost and destination as top factors in their selections (CLIA, 2015). These cruisers are advance planners, with most preparing a trip between 4 and 18 months before departure (CLIA, 2017). This extended planning period implies that cruise travelers' decision making is essential to cruise tourism's international growth. Despite steadily climbing cruise passenger volume over time, except for the year 2020 due to the effects of the COVID-19 pandemic on global tourism, those who have traveled via cruises represent only a small proportion of the global travel population. Much is left to explore in terms of the cruise market, especially in the U.S. and mainland China, which are currently the top players in the cruise industry. It is essential to understand what inhibits people from taking cruise vacations in order to formulate effective strategies to attract and retain tourists in this market. In particular, an understanding

of the differences between cruising constraints in current markets (i.e., the U.S.) and emerging markets (i.e., China) is likely vital to the development of cruise tourism.

Hung and Petrick (2010) developed a measurement scale for cruise constraints based on a survey of cruisers and non-cruisers in the U.S. Following the theoretical literature related to constraints, their instrument consists of four factors: *intrapersonal constraints*, *interpersonal constraints*, *structural constraints*, and *not an option*. Their results indicated that non-cruisers reported more intrapersonal and interpersonal constraints than cruisers, whereas cruisers mentioned more structural constraints. Many studies have suggested that travel constraints differ among market segments (e.g., Fleischer & Pizam, 2002; Nyaupane & Andereck, 2008; Pennington-Gray & Kerstetter, 2002). However, the persistence of these constraints relative to time within the same culture remains unknown. It would be risky to assume that travel constraints remain the same over time within the same culture without empirical evidence. Therefore, the first research question that the study seeks to address is "Do people from the same culture change their perceived constraints over time?" Hung, Wang, Guillet, and Liu (2019) reviewed 62 cruise tourism papers published in English-language journals and found that more than half of the studies (53.2%) were conducted in the U.S.; only four were based in mainland China (6.5%). Among the four investigations of cruise tourism in mainland China, none addressed constraints to cruising. Relevant insight is sorely needed to understand this relatively new market and its distinctions from more mature markets in other cultures, such as the U.S. Thus, another intriguing question addressed in this study is "Are travel constraints universally similar or different between cultures?"

Therefore, this study aims to compare constraints to cruising within the same culture across different times (Americans in 2008 and 2017) and between different cultures at the same time (Chinese and Americans in 2017). A clearer understanding of constraints in different market segments could also promote the development of strategic marketing campaigns (Pennington-Gray & Kerstetter, 2002). Theoretically, as the Chinese market emerges and the U.S. market continues to grow, it will be useful to understand if cruising constraints in a particular market segment have evolved over time and how culture may influence constraint differences in U.S. and Chinese markets, the two most prominent markets for cruise tourism. Such inquiries are important for testing the transferability of knowledge based on time and culture, dimensions that are largely absent from the literature. Methodologically, this study represents a breakthrough in tourism and hospitality research: the integration of multiple approaches (longitudinal and cross-cultural) and different timeframes (data collection in the U.S. in 2008 and 2017 plus data collection in China in 2017) in one study has rarely been seen in the literature. Most studies have assumed a singular approach, namely either a cross-cultural or longitudinal perspective. However, these methods should not be considered mutually exclusive in cultural studies; they can in fact be complementary in storytelling. Our understanding of culture could be greatly expanded by investigating the effect of time within a single culture as well as the impacts of culture across different regions. Such empirical integration has not yet occurred and is much needed to elicit a fuller understanding of culture. In other words, the effect of culture should be viewed horizontally (across different cultures at the same time) as well as vertically (across different times in the same culture). This study promotes parallel thinking by including multiple regions and times while incorporating cross-cultural and longitudinal perspectives to reveal a vivid picture of cultural effects. Practically, this type of study can guide cruise industry stakeholders in formulating effective strategies and policies to attract and retain potential cruisers without assuming the transferability of constraint knowledge across time and cultures.

2. Literature review

2.1 Cruise tourism

The modern cruise industry was born following the first Boeing 707 flight from New York to Europe in 1958 (Kwortnik Jr., 2006). With a rapidly shrinking transatlantic passenger base, opportunistic shipping companies repositioned their services from transportation to vacation travel (Kwortnik Jr., 2006). Cruising has been defined as an expensive, formal, and relatively lengthy vacation that lasts from 7 to 14 days on average, an image contributing to the product's lofty connotations and limited appeal (Kwortnik Jr., 2006). The greatest benefit derived from these types of vacations has been suggested to be the opportunity to visit several destinations in one trip (CLIA, 2015).

Cruise tourism can be defined as "a socio-economic system generated by the interaction among human, organizational, and geographical entities, aimed at producing maritime transportation-enabled leisure experiences" (Papathanassis & Beckmann, 2011). The increasing popularity of cruises and the corresponding growth of vessel sizes has shifted perceptions of cruise ships from "floating hotels" to "floating resorts" (Papathanassis, 2012). In addition to bars, clubs, restaurants, and pools, modern ships often offer mega-facilities such as shopping promenades, theatres, water slides, ropes courses, and other amenities. The growing number of cruise lines has expanded the diversity of cruising products, such as themed cruise ships and luxury ships. Weaver (2005) applied the "McDonaldization thesis" to cruise tourism but noted that the notion failed to adequately capture the nature of production and consumption onboard "supersized" cruise ships.

The number of cruise tourism publications in top journals has increased substantially as of late, addressing themes including customer research, cruise management, employee management, and destination management (Hung, Wang, Denizci Guillet, & Liu, 2018). Perhaps the most popular topic has been customer research, including studies related to satisfaction (Petrick, 2004a), value (Petrick, 2004b), loyalty (Petrick, 2004c), price sensitivity (Petrick, 2005), decision making (Petrick, Li, & Park, 2007), and behavioral factors (Hung et al., 2018). For example, De Cantis, Ferrante, Kahani, and Shoval (2016) used GPS technology to investigate cruise passengers' behavior at a destination. Their findings revealed seven broad activity patterns and suggested that several sociodemographic characteristics and other passenger features are associated with movement patterns at a destination.

The vast majority of cruising customer research has focused on Western travelers, with studies on cruise tourists from mainland China being comparatively limited (Hung et al., 2018). The emergence of Chinese markets has led to recent research on Chinese travelers' motivations (Hsu & Li, 2017; Petrick, Zou, & Hung, 2017), servicescape (Lyu, Hu, & Mao, 2017), and cruising experience (Hung, 2018). These studies, summarized below, reveal that the Chinese market is likely distinct from its Western counterpart.

Hsu and Li (2017) developed a measurement scale for cruise motivation in emerging markets, including mainland China and Hong Kong. Their results indicated that cruise motivation can be explained by eight factors, with *novelty* and *escape* serving as the primary motivations for Chinese cruisers. Additional motivating factors included *nature*, *leisure*, *social interaction*, *relaxation*, *relationships*, and *isolation*. These features differ from those pertinent for Westerners, for whom Durko and Petrick (2015) identified relaxation, socializing, and culture as key drivers.

Lyu, Hu, Hung, and Mao (2017) assessed the servicescape of cruise tourism from Chinese tourists' perspectives and found the servicescape construct to contain six dimensions: *facilities and décor*, *natural scenery*, *onshore excursions*, *onboard entertainment*, *social*

interactions, and *dining services*. Somewhat similarly, Petrick, Toner, and Quinn (2006) found that Western cruisers most often positively referred to several specific cruise features: service, staff/crew, food and beverage, entertainment, ship facilities, and ports of call. In addition, Hung (2018) explored the meaning of cruising among Chinese travelers by applying a photo-interviewing technique to develop a hierarchical structural model of the cruising experience within this population.

2.2 Travel constraints

Leisure constraint research dates back at least a century, but scholars in North America have only conducted systematic studies over the past four to five decades regarding the constraints people encounter to fulfilling leisure activities. In earlier studies, "constraints" were simply defined as barriers (Hung & Petrick, 2010), traditionally assumed to constitute intervening variables in the leisure preference–participation relationship (Crawford & Godbey, 1987). Later, "constraints" were redefined as factors that inhibit continued use of leisure services, result in one's inability to participate in a new activity, hinder one's ability to maintain or increase frequency of participation, and/or adversely affect the quality of a leisure experience (Nadirova & Jackson, 2000).

Crawford and Godbey (1987) outlined three types of leisure barriers: *intrapersonal barriers*, wherein the primary relationship of importance is between preferences and barriers; *interpersonal barriers*, which result from either the incongruence of individuals' intrapersonal barriers or from behavioral patterns of interpersonal relations; and *structural barriers*, namely intervening environmental factors such as time, financial resources, and facilities, which hinder potential leisure participation. Later, Crawford, Jackson, and Godbey (1991) modified these three discrete constraint models and suggested that intrapersonal, interpersonal, and structural constraints be recast as an integrated model in which leisure participants are viewed as having negotiated a sequential, hierarchical series of constraint levels. The body of empirical research on leisure constraints increased enormously in the 1980s, highlighting theoretical and practical implications (Jackson, 2000).

Travel constraint studies have been grounded by the leisure constraints literature and have resulted in systematic examinations of travel constraints (Hung & Petrick, 2010). Such studies have been conducted in diverse tourism contexts. For example, Cho, Bonn, and Brymer (2017) identified constraint factors to visiting wine regions, including lack of interest, lack of information and knowledge, lack of money and time, inconvenient accessibility, and lack of family programs. Also, Nyaupane, Morais, and Graefe (2004) used a three-dimensional leisure constraints model to examine a trio of nature-based tourism activities, with results supporting use of the model for these activities. However, the importance of leisure constraints was found to vary across activities for the same group of individuals. Further, Lai, Li, and Harrill (2013) investigated Chinese outbound tourists' perceived constraints to visiting the U.S. They found intrapersonal and structural constraints to be prevalent for Chinese outbound tourists whereas few interpersonal constraints were reported.

Additionally, in the context of wine destination tourism, Bonn, Cho, Lee, and Kim (2016) found that the negative impacts of structural constraints on revisit intention were weaker when people were emotionally attracted to a specific wine destination and/or when wine-specific attractions appealed strongly to visitors. They also noted that the negative effects of intrapersonal constraints on revisit intention were weaker when positive perceptions about

"wine-specific attractions" and/or "tourism infrastructure" attributes were strong (Bonn, Cho, Lee, & Kim, 2016).

Constraint studies have indicated that constraints depend on the type of travel activity and participant groups. For instance, Kang's study (2016) associated space–time constraints with spatial travel patterns, pointing out that authority-related constraints (i.e., the purpose of travel) were significantly associated with the macro level (i.e., single- and multi-destination travel). Meanwhile, capability constraints (i.e., the length of travel) and coupling constraints (i.e., travel party composition) were significantly associated with the micro level (i.e., multi-destination travel patterns). Alegre, Mateo, and Pou (2010) examined budgetary constraints affecting potential tourism participation among a European community household panel and found that non-financial variables, such as level of education, age, and barriers associated with poor health status, shaped the degree of importance that households assigned to budgetary constraints. Furthermore, Fleischer and Pizam's research (2002) on tourism constraints among Israeli seniors confirmed that this market segment is not heterogeneous in its vacation-taking behavior. In addition, Pennington-Gray and Kerstetter (2002) tested three types of constraints from Crawford et al. (1991) in the context of nature-based tourism. Their results suggested that their data fit the three-constraint model despite differences in age and family life cycle stage.

Leisure constraints research began in China in the early 1990s, but relevant publications emerged gradually (Dong & Chick, 2012). In recent years, the number of studies on leisure or tourism constraints among the Chinese has increased, with research conducted in contexts such as leisure activities (Dong & Chick, 2012), outbound tourism (Lai et al., 2013), calligraphic landscape experiences (Zhang, Zhang, Cheng, Lu, & Shi, 2012), and dark tourism (Zhang, Yang, Zheng, & Zhang, 2016).

In an exploratory study intended to determine constraints to cruising, Kerstetter, Yen, and Yarnal (2005) found that cruise tourists encounter structural, intrapersonal, and interpersonal constraints along with constraints the authors termed "not an option"; that is, some potential cruisers do not even consider cruising as a vacation possibility. Hung and Petrick (2010) also found this to be the case along with Zou and Petrick (2017).

In a study examining the potential for cruise tourism, Zou, Migacz, and Petrick (2017) found that potential Chinese cruise tourists were most drawn to cruising due to novel experiences, relaxation, and being near the sea. The strongest constraints consisted of time, safety, seasickness, and money. Zou and Petrick (2016) segmented potential Chinese cruise tourists into low-, medium-, and high-constraint groups and found that more than 40% of their sample reported a high level of perceived constraints. Also, individuals with the most constraints were the least educated. The authors further found that those who were least constrained were more likely to be older and retired and to have significantly more positive perceptions of cruise vacations. Further, Zou and Petrick (2017) found that Chinese tourists were most constrained from taking a cruise based on other travel alternatives, difficulties obtaining cruise-related information, safety concerns, the immaturity of China's cruise industry, and the expense of a cruise vacation.

The literature reviewed thus far has predominantly involved the Western hemisphere; limited work has sought to understand Chinese cruisers' travel constraints. By and large, the constraint measures of Chinese travelers in these studies were drawn from prior studies focusing on their Western counterparts. Given evidence of distinct cultural values and leisure preferences between China and the U.S. (Fan & Hsu, 2014; Mok & Defranco, 2000; Lyu, Hung, & Mao, 2017), one would be remiss to assume that measures are uniformly applicable across cultures. The same observation applies when adopting measures for the same culture

across different times. Overall, there is a general lack of evidence substantiating the transferability of knowledge across cultures and time, which may result in questionable research validity.

The associations between cultural differences and leisure constraints have been empirically examined. Walker, Jackson, and Deng (2007) compared how perceptions of 10 intrapersonal constraints and perceptions of intrapersonal, interpersonal, and structural constraints influenced initiation of a new leisure activity among university students in Canada and mainland China. They discovered that nine of 10 intrapersonal constraint items varied significantly, and the three constraint categories were significantly different. In the context of dark tourism, Zhang, Yang, Zheng, and Zhang (2016) identified culture as one of the four sub-dimensions (i.e., *culture*, *emotion*, *escape*, and *incuriousness*) in intrapersonal constraints. Despite efforts to understand Chinese constraints related to leisure and travel from a cross-cultural perspective, both of these studies used a student sample, measures developed for Western travelers, and one-time data collection. These practices exemplify limitations of cross-cultural studies, as solely using cross-sectional data can elicit fragmented findings that limit knowledge transfer and accumulation.

2.3 Cross-cultural validation and triangulation of measurement scales

Sound research begins with sound measurement; conversely, poor scale construction calls into question the reliability and validity of research results, no matter how rigorous the study design (Hinkin, Tracey, & Enz, 1997). It is recommended that data from sources other than respondents, such as performance appraisals, be collected whenever possible to ensure reliability and validity (Hinkin et al., 1997). However, similar to marketing research, less attention has been given to scale validation in tourism (Hosany et al., 2015).

Culture, in its various manifestations, exerts substantial impacts on tourist behavior; studying cross-cultural tourist behavior is important because tourism is an international industry (Li, 2014). However, cross-cultural consumer research in hospitality and tourism has remained largely neglected in scholarly journals (Li, 2014). It is also worrisome that measurement scales applied in cross-cultural studies have generally been developed in the U.S. and translated into local languages to measure given constructs in culturally diverse groups (Li, 2014); only a few studies have included cross-cultural validation of measurement scales. For example, Kim and Ritchie (2014) used a sample of Taiwanese respondents to replicate a memorable tourism experience scale that had previously only been examined using a sample of American college students. Results showed that the measurement scale could be used to assess individuals' memorable tourism experiences in cross-cultural settings. Relatedly, in terms of destination image assessment, attributes of image perceptions and attractiveness may vary across countries of origin (MacKay & Fesenmaier, 2000).

In addition to cross-cultural validation, measurement scales' validity should be tested with different samples. In tourism research, triangulation has mainly been discussed in qualitative studies to limit personal and methodological biases. Denzin's four basic types of triangulation (i.e., data, method, investigator, and theoretical triangulation) are often proposed in such cases (Decrop, 1999). Belhassen and Santos (2006) explored the political dimensions of American evangelical pilgrimages to Israel using data triangulation and outlined four functions of such triangulation, namely corroboration, exploration, understanding, and enriching the findings. Triangulation facilitates verification of results and, in so doing, can identify and eliminate methodological shortcomings and data or investigator bias (Oppermannt, 2000). Triangulation is therefore applicable to both qualitative and quantitative

studies. Hosany et al. (2015) examined the construct validity of a destination emotion scale using two samples – international tourists visiting two distinct destinations, Petra (Jordan) and Thailand – and found overwhelming support for the scale's validity in other contexts. Moreover, Koc and Boz (2014) examined triangulation in tourism research by conducting a bibliometric study of three top tourism journals (*Annals of Tourism Research*, *Tourism Management*, and *Journal of Travel Research*) between 2003 and 2012. They discovered that in many research papers (70.3%), the authors did not engage in triangulation and used a single means of data collection.

While constraints to cruise tourism have been explored to some degree (e.g., Hung & Petrick, 2008; Zou & Petrick, 2016, 2017), neither longitudinal nor cultural comparisons have been conducted to enhance understanding of such constraints. This is likely an important area of study; as discussed above, travel constraints may not be homogeneous across different groups or at different times (Pennington-Gray & Kerstetter, 2002). Therefore, this study seeks to obtain a deeper understanding of cruise constraints in two major markets, the U.S. and China. Hence, within-country (U.S. data in different years) and between-country (U.S. vs. China) comparisons were conducted. More specifically, the objectives of this study were as follows:

1) To compare constraints between these two likely distinct markets. This longitudinal and cross-cultural approach should foster a clearer understanding of cruise constraints and provide a framework to guide other studies pursuing similar topics.

2) To examine how constraints to cruising have evolved in the U.S. market, using a data triangulation approach to test the validity of the constraint measurement scale. Although notable efforts have been made to develop new scales, relatively less attention has been devoted to scale validation in tourism (Hosany, Prayag, Deesilatham, Cauševic, & Odeh, 2015). This paper offers further validation of the cruise constraints scale while considering culture and time.

3. Methods

Several steps were employed in this cross-cultural (Chinese vs. Americans in 2017) and longitudinal (among Americans in 2008 and 2017) study. The study takes Hung and Petrick (2010) as an initial stage of investigation. In Hung and Petrick's (2010) work, the authors developed a measurement scale for constraints to cruising and collected data from American travelers. The study followed measurement scale development procedures proposed by Churchill (1979). First, interviews were conducted with 43 American travelers to understand their cruising constraints. Fifty-five constraint items generated from interviews and a literature review were submitted to a panel of tourism experts for review to condense the items to a manageable number. A pilot test was then conducted with 293 undergraduate students to assess the measure's factor structure and reliability. Using exploratory factor analysis, items with cross-loading problems and low factor loadings were removed. An online survey was subsequently conducted with American travelers who fulfilled the three sampling criteria applicable to the cruising market at that time: (1) 25 years old or older; (2) 50/50 gender distribution; and (3) earned an annual household income of at least US$25,000. A sample of 897 survey respondents was obtained in 2008 (333 non-cruisers and 564 cruisers). The final 18-item measure demonstrated satisfactory reliability and validity (Hung & Petrick, 2010).

The developed measure was later applied in an investigation of cruising constraints among Chinese and Americans in 2017. An online survey was conducted in mainland China and the U.S. via the same reputable survey company. The questionnaire was composed in English based on Hung and Petrick (2010) before being translated by two bilingual (Chinese–English) tourism scholars into simplified Chinese, the official language of mainland China. The two researchers verified their translations with one another to ensure the accuracy of items' meanings. The questionnaire was then pilot tested with 37 Chinese travelers to refine items prior to distributing the measure to a large sample. The sample was conveniently recruited from a post-graduate course in which all students were working full-time but studying part-time. The main purpose of the pilot test was to improve the questionnaire prior to collecting main data. Pilot testers offered suggestions regarding Chinese wording, which helped to align respondents' understanding with researchers' intended meanings for each item.

After the pilot test, the Chinese questionnaire was distributed to qualified Chinese travelers via a reputable survey company based on the following sampling criteria: (1) 25 years old or older; (2) 50/50 gender distribution; and (3) earned an above-average annual household income. Screening questions were included at the beginning of the surveys to exclude individuals who did not qualify for the study. While North American cruisers tend to be middle aged, married, affluent, and highly educated (CLIA, 2017; 2018b), the demographics of Asian cruisers were not readily available in cruise reports. However, according to Mr. Kevin Leong, General Manager of the Asia Cruise Association, Asian cruise clients tend to be between 25 and 55 years old (mid-40s on average). Therefore, the target samples in this study were set to be 25 years old and older; this age parameter also matches the target market of cruise line companies in the U.S. A 50:50 gender distribution was adopted to ensure a balanced view from women and men. Furthermore, only financially viable consumers were included in the samples; cruising is considered a luxury activity (CLIA, 2016b), and the cruise industry's target customers are often high-end consumers.

Similar to Hung and Petrick (2010), the screening question "Have you ever cruised before?" was presented at the beginning of the survey to determine respondents' cruising history. Both cruisers and non-cruisers were included in this study, resulting in 1,600 usable responses collected in mainland China; of these, 916 were from cruisers and 684 were from non-cruisers. Similar sampling criteria were applied for data collection in the U.S. In addition to the same criteria for age and gender distribution, respondents were required to earn an annual household income above the national average; the sample yielded 800 usable questionnaires (548 from cruisers and 252 from non-cruisers). The higher sample size in China was due to budgetary parameters and the main study being focused on China. Data were collected in July 2017. The survey company provided data in SPSS format for further analysis. Demographic profiles of the three samples are presented in Table 1. A 7-point Likert-type scale was applied in all rounds of data collection to measure constraint-related items.

Insert Table 1 here

Sampling bias was checked by comparing the 2017 U.S. respondents' demographic statistics with the 2014 North American cruise market profile (CLIA, 2015) given the unavailability of a more updated profile. The age groups among the 2014 North American cruise market were distributed as follows: 25–29 (8%), 30–39 (23%), 40–49 (17%), 50–59 (24%), 60–74 (24%), and older than 75 (4%) (CLIA, 2015). This distribution is similar to that

in the 2017 U.S. data (Table 1). Most North American cruise travelers were employed (72%), 21% were retired, and 7% were not employed (CLIA, 2015); the employment status distribution in the 2017 U.S. data (Table 1) again reflected a similar profile. Education level was also found to be similar: most North American cruisers were college-educated (including post-graduate), which is highly similar to the ratio of bachelor and post-graduate degrees (69.9%) among the 2017 U.S. sample. In terms of marital status, 84% of North American cruisers in 2014 were married, as were 73.4% of respondents in the 2017 U.S. data. On the whole, U.S. respondents in this study appeared demographically similar to typical North American cruisers. Also, the sample of 2017 China data was checked for bias by comparing respondents' demographic characteristics with those from the Annual Report on China's Cruise Industry (2015) (Pinchain, 2015). According to the Annual Report on China's Cruise Industry (2015), Chinese cruisers were 38 years old on average; more than 70% held a bachelor or post-graduate degree; and more than 90% were either employed, self-employed, or retired (Pinchain, 2015). These profiles were quite similar to those in the 2017 Chinese data (see Table 1), suggesting that the Chinese respondents in this study were similar to typical Chinese cruisers.

4. Results

4.1 Exploratory factor analysis (EFA) and confirmatory factor analysis (CFA)

In this study, CFA was first conducted for the 2017 U.S. sample (n = 800) to examine whether results confirmed the four underlying dimensions of cruise travel constraints reported by Hung and Petrick (2010), who collected the U.S. sample in 2008. As seen in Table 2, the four dimensions were confirmed based on significant factor loadings and goodness-of-fit indices [χ^2 = 758.06 (df = 120), RMSEA = 0.08, CFI = 0.96, TLI = 0.95], suggesting that the model fit the data well (Hair et al., 1998).

For data from China, CFA was first performed to determine whether the U.S. measurement model fit the China data. The goodness-of-fit indices [χ^2 = 3,210.18 (df = 127), RMSEA = 0.12, CFI = 0.88, TLI = 0.86] suggested that the measurement model did not adequately fit these data. Because different cultural values may render China data distinct from U.S. data, EFA was performed to check the underlying dimensions of the China data. As suggested by DeVellis (1991), the sample (n = 1,600) was divided into two sub-samples. Sub-sample 1 (n = 800) was selected for EFA to identify underlying dimensions, after which sub-sample 2 (n = 800) was adopted as a holdout sample for CFA. EFA was first conducted to identify the underlying dimensions of cruise travel constraints based on principal axis factoring and oblique rotation. Unlike the U.S. data, the China data showed only two underlying dimensions of cruise travel constraints with 66.97% of the variance explained according to EFA (Table 3). CFA (Table 4) then confirmed the two dimensions based on significant factor loadings and acceptable goodness-of-fit indices [χ^2 = 614.13 (df = 93), RMSEA = 0.08, CFI = 0.96, TLI = 0.95]. The different factor structure between the China and U.S. data is discussed in greater detail in Section 5.

Insert Table 2, 3, & 4 here

4.2 Scale validation: Reliability, construct validity, and measurement invariance

Table 5 (China sample) and Table 6 (2017 U.S. sample) display the reliability and average variance extracted (AVE) for underlying dimensions. All reliability measures exceeded 0.7

(Nunnally, 1978) and were hence deemed acceptable. Further, all AVE values were greater than 0.5 (Fornell & Larcker, 1981), and all factor loadings from CFA were statistically significant ($\alpha < 0.05$), suggesting that the scales exhibited convergent validity (Anderson & Gerbing, 1988). Discriminant validity was also determined, as each square root of the AVE was higher than the corresponding inter-construct correlation (Fornell & Larcker, 1981).

Insert Table 5 & 6 here

Measurement invariance testing was conducted to cross-validate the scales based on metric invariance and scalar invariance (Hair et al., 2006). Metric invariance was tested by measuring whether factor loadings (i.e., measurements) of the two sub-samples were invariant. For the China data (Table 7), sub-samples for EFA and CFA were used for metric invariance testing. Two additional sub-samples (men vs. women) were adopted for metric invariance analysis given that men and women have often expressed distinct consumer/tourist behavior (Kim, Lehto, & Morrison, 2007). Chi-square differences reflected metric invariance for sub-samples 1 and 2 [$\Delta\chi^2(22.80) = 26.30, p > .05$] and men vs. women [$\Delta\chi^2(21.87) = 26.30, p > .05$], implying that the measurements were equivalent across these sub-groups.

For the U.S. data (Table 8), the sample was also split into sub-sample 1 ($n = 400$) and 2 ($n = 400$) and men and women for metric invariance testing. The chi-square difference indicated that measurements were invariant between sub-samples 1 and 2 [$\Delta\chi^2(20.33) = 28.87, p > .05$] and between male and female groups [$\Delta\chi^2(24.36) = 28.87, p > .05$].

Moreover, scalar invariance testing was conducted by constraining the intercepts of measures to check the metric invariance of the two groups (Schmitt & Kuljanin, 2008). The chi-square difference tests substantiated scalar invariance in the data from China [$\Delta\chi^2(20.57) = 26.30, p > .05$] and the U.S. [$\Delta\chi^2(26.39) = 28.87, p > .05$]. Therefore, the metric invariance tests verified measurement invariance in the data from China and the U.S.

Insert Table 7 & 8 here

4.3 Test of method biases: Non-response bias and common method bias

In line with Armstrong and Overton (1977), non-response bias was assessed by comparing the first 10% of completed surveys with the last 10% in terms of cruise constraint measures. A *t*-test revealed no statistical difference between the first and last 10% groups in the U.S. and China data with the exception of one item from China ("Cruising never occurs to me as a travel option"; $p = .057$); therefore, non-response bias was deemed negligible in this study.

Common method bias was also tested due to concerns that it can lead to systematic measurement error and affect the validity of research outcomes (Bagozzi & Yi, 1990). As proposed by Bagozzi and Yi (1990), this study employed analysis of multitrait–multimethod matrices to assess common method bias. As this form of bias is not caused by traits but by methods, a chi-square difference test was used to identify differences between a trait-only model (a baseline model) and a trait–method model. Because the chi-square difference test was not statistically significant in terms of data from the U.S. [$\Delta\chi^2(31.26)/\Delta df\,(26) = 38.89, p > .05$] and China [$\Delta\chi^2(10.11)/\Delta df\,(7) = 14.07, p > .05$], common method bias was not a concern in this study.

5. Discussion and implications

Scholars have often called for more longitudinal studies (e.g., Lu & Nepal, 2009; Tassiopoulos & Haydam, 2008; Sirakaya, Teye, & Sönmez, 2002) and cross-cultural research

(e.g., Dimanche, 1994; Sophonsiri & Polyorat, 2009; Haq & Wong, 2010). However, these recommendations have seldom been realized due to factors including lack of access to data, a one-off approach commonly adopted with research funds, and limited research time and budget. While cross-sectional studies continue to be a primary source of knowledge creation in the tourism and hospitality literature, longitudinal and cross-cultural studies have also been promoted as good practice in scientific inquiry.

As an example, Valentine, Allison, and Schneider (1999) found that among 1,352 articles published in leading leisure science journals, only 20 (1.5%) were cross-national studies. The authors thus called for a global perspective in leisure research, particularly in terms of cross-cultural research to promote interdisciplinary inquiry by comparing English and non-English speaking countries. Unfortunately, leisure and travel constraints have traditionally been studied in a cross-sectional manner. Although such investigations are essential to discovering new theories, longitudinal and cross-cultural approaches ought to be incorporated into long-term research agendas to discover, verify, and sustain knowledge. This study aimed to contribute to constraint research by including longitudinal and cross-cultural comparisons on the same set of measures to evaluate the effects of time and culture on a travel constraint instrument.

Measurement items were developed in 2008 based on Churchill's (1979) recommended procedures. Results from the 2017 U.S. data revealed that all items retained in the measurement scale were identical to those from the 2008 data, and the factor structure exhibited impressive robustness across time. These findings suggest that the measurement fits U.S. non-cruisers despite the passage of time.

Compared to U.S. data in the same year, the measurement scale for the China data was not as clear-cut as in the other datasets. In a Chinese context, the scale displayed two dimensions with items integrated from different factors without a clear theme. Nevertheless, the 16-item measurement scale with two dimensions displayed satisfactory reliability and validity. The overall results suggest that culture plays a role in constraint measurement development. In light of disparities in the data, it is reasonable to assume that some constraints experienced by the Chinese may not be captured by a measurement scale developed in the U.S. context; therefore, a scale specifically intended to measure Chinese cruising constraints is needed.

Triangulation with multiple research methods has often been encouraged in the scholarly community as a means of ensuring the reliability and validity of research findings. Denzin (1978) categorized triangulation as either between-methods or within-methods. The former refers to validating study findings via multiple methods such as qualitative and quantitative approaches, whereas the latter uses different techniques within a given method (e.g., including various measures of the same construct in a study). Field and Morse (1985) further classified methodological triangulation as either simultaneous (two methods at once) or sequential (testing the results of one method at different times). Further, Jick (1979) proposed a holistic approach to triangulation, contending that triangulation goes beyond the traditional functions of scaling, reliability testing, and convergent validity to facilitate new knowledge formation.

Following similar logic, the current study aimed to triangulate a constraint measure within one country at different times using longitudinal data and between two cultures (i.e., the U.S. and China) at the same time. This type of triangulation extends beyond validating study results via different methods to emphasize the role of study context in measurement scale development in terms of time. In other words, the current study sought to unveil whether research findings would hold true in contexts that varied over time and culture. Results

suggest that the selected constraint measure is more robust within the same culture across different times than across different cultures at the same time.

Theoretically, the results of this study offer implications for scale development related to cruising constraints and other topics. First, it is necessary to develop a measurement scale for cruising constraints in the Chinese context, as the results of this study show that the scale developed in the U.S. cannot be laterally applied to the Chinese market. As China represents a major potential market for cruise tourists, understanding cruising constraints among the Chinese is crucial for effective marketing. Second, although numerous scale development studies have appeared in different tourism and hospitality contexts, scale validation deserves more attention. Specifically, in scale development research, it is important to consider different cultural contexts and ideally to include samples from different cultures when formulating scales.

Practically, Chinese travelers did not appear to encounter many constraints to cruise travel based on the constraint measure (grand mean: 3.21). The mean scores of all constraint items were below 4.0 with a few items below 3.0, reflecting a high potential of converting travelers from non-cruisers to cruisers. This pattern is promising for cruise tourism, which has recently emerged in China; it suggests that the industry could be highly welcomed by the Chinese. This trend also helps to explain the surge in Chinese travelers aboard cruises as well as China's leading market position in Asia based on the number of cruise passengers in recent years (CLIA, 2017).

As a relatively young market, China presents similar constraint characteristics to the U.S. market a decade ago given China's low mean scores on constraint measures. Compared to the Chinese and U.S. markets in 2008 (grand mean: 2.35), the U.S. market in 2017 appeared to have more constraints to cruise travel with a grand mean of 3.63, and two constraint items in the 2017 U.S. data (i.e., "Many other travel alternatives that I'd like to do before cruising" and "Cruising is not my family's lifestyle") were scored above 4.0. Nevertheless, all markets show promise for the upcoming years in terms of developing cruise tourism in light of generally low constraints. Based on the literature cited above and cultural differences between Chinese and U.S. travelers, it is likely that more home ports, better designed cruise ships, diverse cruise itineraries, and excellent services (both onboard and offshore) will be needed to generate loyal cruisers. Cruise ship companies and relevant parties should monitor tourists' cruising experiences closely and respond to changing market demands as necessary.

Tables 2 and 3 present the means for all constraint items and illuminate differences between the U.S. and Chinese samples. Interestingly, the top constraint for the U.S. and Chinese markets was "Many other travel alternatives that I'd like to do before cruising." Therefore, a likely priority for the cruise industry involves converting non-cruisers into cruisers, given the market potential as demonstrated by these travelers' low barriers to cruising. Because cruise tourism is a newly developed form of travel in Chinese society, general awareness and understanding of cruising are likely rather limited. Although intuitive travel decisions may exist, research has shown that tourists often follow a funnel-like choice filtering process to reach a final travel decision. In Crompton and Ankomah's (1993) choice set model, travel decision making begins with a number of destination choices in the early consideration set, followed by filtering and eliminating less-desirable destinations before reaching a final destination choice. This logic implies that incorporating cruise travel into tourists' early consideration sets is the first step in encouraging travelers to select a cruise as a final travel choice.

Another top constraint was "Worry about security on cruise ships," whose mean value was 3.93 in 2017 U.S. data (the third strongest constraint) and 3.70 in China data (the second

strongest constraint). Thus, it is important to improve tourists' sense of security around cruise tourism. In particular, negative news surrounding several cruise ships during the COVID-19 crisis may further influence the public's perceptions of cruising safety. Collectively, in our view, developing cruise tourism culture, raising awareness of cruising, and improving travelers' sense of safety in cruise tourism are essential to tapping the market of non-cruisers in the U.S. and China. Further investigation is necessary to determine which tactics will be most effective in converting non-cruisers to cruisers.

6. Limitations and recommendations

A major limitation of this study is that it was only longitudinal from U.S. travelers' perspectives. The single sample of Chinese tourists in 2017 and the overall study results suggest that cruising constraints facing U.S. travelers have limited applicability in the Chinese market. Ideally, a measurement scale should be developed from scratch based on Chinese informants' input to tailor a measurement scale to the Chinese context, although such efforts were not possible in the current study due to time and budgetary limitations. Thus, future research should seek to establish a customized measurement scale for Chinese tourists and validate the findings based on multiple samples from a longitudinal perspective.

This study could have been further enhanced by including consecutive annual data from 2008 to 2017. However, this approach was not feasible given the research team's limited resources and unavailability of relevant data in the public domain. In this study, data collection at different times was strictly monitored by using the same measures, closely matched samples, and identical data collection methods in different years. Using a large and representative sample in each data collection round also speaks to the quality of the data in addressing the research questions.

In addition, this study investigated cruise-related constraints from a cross-cultural perspective. Findings indicate clear cultural differences between the U.S. and Chinese markets in terms of cruising constraints. However, this study did not fully explore why these discrepancies may exist. Therefore, future research should examine this issue to offer insight into how different cultures influence cruising constraints among travel markets.

7. Concluding remarks

In terms of cruise development, it can be argued that China is the center of the Asian market and the U.S. is the center of the North American market. This study shows that both markets have great potential to increase their customer base given low constraints to cruising. While a relatively robust cruise constraint measure has been developed for U.S. travelers, China appears in need of a tailor-made scale to further clarify Chinese constraints to cruising. Nevertheless, this study sheds light on Chinese constraints using a measure developed for the U.S. market. The results provide practical direction for cruise managers regarding which constraints are strongest for both cultures and how to assist potential consumers in negotiating these constraints. Theoretically, we should not assume equal transferability of knowledge across cultures and time; empirical evidence should be drawn from various contexts before reaching conclusions for knowledge development and accumulation.

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Table 1. Respondent demographics

	2017 China Data (N = 1,600)	2017 US Data (N = 800)
Gender		
Male	52.9%	50%
Female	47.1%	50%
Age		
25-29	26.2%	9.6%
30-39	50.1%	46.9%
40-49	18.6%	12.9%
50-59	4.2%	14.3%
60-74	1.0%	16.4%
75 +	--	--
Marital Status		
Married	86.6%	83.4%
Single/Divorce/Separated	13.4%	16.6%
Education		
High school degree	3.0%	8.4%
Associate degree	15.4%	10.4%
Bachelor degree	70.9%	29.4%
Post-graduate degree	10.6%	51.7%
Employment Status		
Full-time employed	90.6%	65.9%
Part-time employed	6.0%	16.1%
Not currently employed	2.0%	5.7%
Retired	1.4%	12.3%

Table 2. Results of confirmatory factor analysis for 2017 U.S. data.

Factors	Factor Loading	Mean	*t*-value
Factor 1: Interpersonal constraints			
1. Lonely on a cruise	0.87	3.40	NA
2. No companion to go on a cruise with	0.83	3.39	32.46
3. I might not like my dinner companions on a cruise	0.84	3.67	38.13
Factor 2: Intrapersonal constraints			
1. A fear of the water/ocean	0.83	3.69	NA
2. Sea/motion-sickness	0.82	3.70	28.67
3. Not cruise due to claustrophobia	0.91	3.23	34.35
4. Not cruise because I have poor health	0.92	3.08	34.67
5. Worry about security on cruise ships	0.77	3.93	26.29
6. A special diet is not available on a cruise	0.90	3.08	34.19
7. Not cruise because my spouse/partner has poor health	0.91	3.01	34.36
Factor 3: Not an option			
1. Cruising never occurs to me as a travel option	0.92	3.93	NA
2. My family/friends do not cruise	0.99	3.84	47.58
3. Not interested in cruising	0.93	3.91	33.87
4. Many other travel alternatives that I'd like to do before cruising	0.82	4.53	30.74
5. Cruising is not my family's lifestyle.	0.94	4.02	46.23
Factor 4: Structural constraints			
1. Not cruise due to too many family obligations	0.88	3.60	NA
2. Not cruise due to my work responsibilities	0.89	3.41	36.29
3. Difficult for me to find time to cruise	0.83	3.91	31.87

Note: All factor loadings are significant at $p < .000$. Parameters are fixed at 1.0 for maximum likelihood estimation; thus, *t*-values were not obtained (NA) for those fixed at 1 for identification purposes.

Table 3. Results of exploratory factor analysis for 2017 China data (Sub-sample 1, $N = 800$)

Factors	Factor Loading	SD	Mean (all China data)
Factor 1 (eigenvalue: 10.88; % of variance: 60.47)			
1. Many other travel alternatives that I'd like to do before Cruising	0.81	1.69	3.81
2. Worry about security on cruise ships	0.80	1.80	3.70
3. Difficult for me to find time to cruise	0.79	1.73	3.68
4. Sea/motion-sickness	0.72	1.89	3.42
5. Lonely on a cruise	0.72	1.68	3.22
6. Not cruise because my spouse/partner has poor health	0.63	1.76	3.11
7. My family/friends do not cruise	0.60	1.68	3.16
8. Not cruise due to my work responsibilities	0.54	1.82	3.61
9. No companion to go on a cruise with	0.52	1.77	3.21
Factor 2 (eigenvalue: 1.17; % of variance: 6.50)			
1. Not cruise due to claustrophobia	-0.98	1.75	2.64
2. Not interested in cruising	-0.87	1.77	2.70
3. Cruising is not my family's lifestyle	-0.85	1.69	2.95
4. Cruising never occurs to me as a travel option	-0.83	1.77	2.80
5. Not cruise because I have poor health	-0.73	1.72	2.91
6. Not cruise due to too many family obligations	-0.56	1.63	3.26
7. A fear of the water/ocean	-0.54	1.81	3.14

Note: Kaiser-Meyer-Olkin measure of sampling adequacy = 0.96; Bartlett's test of sphericity = $p < 0.001$.
SD = standard deviation

917 Table 4. Results of confirmatory factor analysis for 2017 China data (Sub-sample 2, $N = 800$)

Factors	Factor Loading	*t*-value
Factor 1		
1. Many other travel alternatives that I'd like to do before Cruising	0.76	24.20
2. Worry about security on cruise ships	0.81	25.46
3. Difficult for me to find time to cruise	0.74	22.64
4. Sea/motion-sickness	0.77	24.15
5. Lonely on a cruise	0.89	29.17
6. Not cruise because my spouse/partner has poor health	0.85	27.48
7. My family/friends do not cruise	0.85	27.27
8. Not cruise due to my work responsibilities	0.74	27.80
9. No companion to go on a cruise with	0.79	NA
Factor 2		
1. Not cruise due to claustrophobia	0.89	28.54
2. Not interested in cruising	0.91	29.52
3. Cruising is not my family's lifestyle	0.93	30.24
4. Cruising never occurs to me as a travel option	0.91	29.24
5. Not cruise because I have poor health	0.85	26.99
6. Not cruise due to too many family obligations	0.82	25.53
7. A fear of the water/ocean	0.78	NA

918 Note: All factor loadings are significant at $p < .001$. Parameters are fixed at 1.0 for maximum likelihood
919 estimation; thus, *t*-values were not obtained (NA) for those fixed at 1 for identification purposes.
920

Table 5. Correlations, reliability, AVE, and means for 2017 China data.

	F1	F2
F1	**0.80**	
F2	0.72	**0.87**
CR	0.88	0.86
Mean	3.30	2.91
SD	1.46	1.57

Note: CR = composite reliability; AVE = average variance extracted; SD = standard deviation. Mean values are based on five-point scales. All correlations are significant at the 0.01 level. The square root of AVE in bold on diagonal line.

Table 6. Correlations, reliability, AVE, and means for 2017 U.S. data.

	F1	F2	F3	F4
F1	**0.84**			
F2	0.82	**0.86**		
F3	0.76	0.77	**0.92**	
F4	0.80	0.82	0.69	**0.87**
CR	0.72	0.86	0.82	0.72
Mean	3.48	3.38	4.04	3.64
SD	2.07	2.04	2.03	2.02

Note: F1: Interpersonal constraints & health concerns; F2: Not an option; F3: Structural constraints; F4: Intrapersonal constraints; CR = construct reliability; AVE = average variance extracted; SD = standard deviation. Mean values are based on five-point scales. All correlations are significant at the 0.01 level. The square root of AVE in bold on diagonal line.

Table 7. Testing for measurement model invariance of China data.

Model	Model Description	$\chi^2(df)$	$\Delta\chi^2(\Delta df)$
1	Freely estimated model for sub-samples 1 and 2	1,161.97(186)	
2	Metric invariance model for sub-samples 1 and 2	1,184.77(202)	22.80(16)
3	Freely estimated model for men vs. women	1,147.49(186)	
4	Metric invariance model for men vs. women	1,169.36(202)	21.87(16)
5	Scalar invariance model for men vs. women	1,189.93(218)	20.57(16)

Table 8. Testing for measurement model invariance of US data.

Model	Model Description	$\chi^2(df)$	$\Delta\chi^2(\Delta df)$
1	Freely estimated model for sub-samples 1 and 2	1,059.15(240)	
2	Metric invariance model for sub-samples 1 and 2	1,079.48(258)	20.33(18)
3	Freely estimated model for men vs. women	969.36(240)	
4	Metric invariance model for men vs. women	993.72(258)	24.36(18)
5	Scalar invariance model for men vs. women	1,020.11(276)	26.39(18)