

# **Biased Minds Experience Improved Decision-making Speed and Confidence on Social Media—A Heuristic Approach**

## **1. Introduction**

Social media constitutes a crucial information source for many travelers and is a tool used to rapidly circulate information (Xiang & Gretzel, 2010). The copious information that is often uploaded by end users and the numerous choices available in the social media environment increase travelers' decision confidence (Ayeh, Au, & Law, 2013), compared with the information and choices provided by service providers. Many travelers even might rely more on peer recommendations of travel products than on official quality ratings in their decision making because they tend to regard consumer advice as more trustworthy (Bansal & Voyer, 2000; Kozinets, 2002). However, because of the open, collaborative, and interactive nature of the social media environment (Kaplan & Haenlein, 2010), the number of product reviews and ratings uploaded by travelers is rapidly increasing. To filter out irrelevant information, travelers must expend more time and efforts evaluating the credibility of online information and choices. Several studies have proven that longer decision time is often associated with weaker sensory evidence and higher error rates (Kiani, Corthell & Shadlen, 2014). Furthermore, in many service systems, customers can tolerate only a limited waiting time for a service and they leave the system if their service has not begun within that time (Kim & Kim, 2014). In the current volatile world, travelers strive to achieve the ability to accelerate decision making and the confidence to make a correct decision. However, in practice, strategies through which travelers manage the challenge of information overload in social media in their decision-making processes remain largely unexplored. In particular, the literature lacks theoretical framework to explain such information-processing behavior, which

could provide more insights into the association of travel decision making associate with information creditability and the resulting decision speed and confidence.

When individuals are faced with excessive choices or information, they tend to turn to employ an information-processing mode that requires less effort but is concurrently more efficient and even more effective (Boyd & Bahn, 2009). This processing mode is referred to as heuristic information processing. By definition, the heuristic approach is an information-processing strategy “that ignores part of the information, with the goal of making decisions more quickly, frugally, and/or accurately than more complex methods” (Gigerenzer & Gaissmaier, 2011, p. 454). According to Chaiken (1980) and Chaiken and Trope (1999), the heuristic approach is likely to promote decision speed and confidence. However, empirical knowledge of the mechanisms through which heuristic information processing is linked with information credibility, decision efficiency, and decision confidence remains scarce; in particular, knowledge of the mechanism through which heuristic information processing influences travelers in the social media environment remains scare. In addition, most prior studies have focused on the effect of consumer-generated media on and the role of social media in promoting product awareness and facilitating purchase decisions (Chen, Feng, Shi & Li, 2013; Cox, 2010). Few studies have examined the factors affecting social media credibility, the relationship between credibility and decision speed, or the influence of credibility on decision confidence. Because information is processed in our biologically limited human minds (Chaiken, 1980), adopting theories based on human information processing may help explain these relationships. Therefore, the primary objective of this study was to examine how heuristic information processing in humans can provide a theoretical basis for evaluating the effect of social media information credibility on decision-making speed and confidence. Furthermore, although the importance of information creditability in online decision-

making is well understood, the extent to which it affects perceived or actual decision speed and confidence remains largely unknown. Insights into these areas would represent significant practical and theoretical contributions to online product promotion effectiveness and market segmentation.

## **2. Literature review**

### *2.1. Social media as an information source for decision-making*

Xiang and Gretzel (2010) noted that social media plays a vital role as an information source for travelers and an information-spreading tool for the hospitality and tourism industry. An increasing number of travelers are relying on the Internet as their most crucial source of information when making decisions related to their trips (Ayeh *et al.*, 2013). Empirical studies have increasingly shown that social media contains abundant information for consumers. Currently, consumers rely on data and information that are available on social media platforms when making individual decisions; thus, such platforms constitute their “personal decision support platform” (Krishnan, 2013, p. xix). Ghose, Ipeirotis and Li (2012) stated that 87% of customers relied on online user-generated content to make hotel-related purchase decisions. Online review sites have also gained considerable prominence. Social media has become an essential “reference group,” and word of mouth (WOM) from travelers is considered the most reliable information source for trip planners (Mavragani, Nikolaidou, & Theodoraki, 2019). A traveler who uses other travelers’ recommendations is more likely to improve their decision making (Filieri, Algezai, & Mcleay, 2015). WOM also helps (or hinders) an industry player’s purpose in advertising. It is more relevant for first-rate products than other products and is less costly than aggressive advertising (Yi & Ahn, 2017). Hotels and travel companies are redefining their business models and operational practices

and seeking opportunities to reach out to their customers, enhance customer relationships, and indulge in long tail marketing.

## *2.2 Information recency in social media*

In a book on big data, Berman (2013) states that “the content of the data is constantly changing, through the absorption of complementary data collections, through the introduction of previously archived data or legacy collections, and from streamed data arriving from multiple sources” (p. xx). This also applies to the information on social media platforms. The interactive features of social media enable travelers to exchange and share ideas. Travelers can also comment on others’ posts. When users are contributing high-quality content with large volumes on social media websites, the website pages are continually refreshed. Facebook has 500 million users in 2010s, half of whom log in on any given day even (Forest & Wood, 2012). Because social media pages are refreshed every few seconds, information is normally quite recent --- a major benefit to travelers. However, information that is possibly current on a given day may disappear from the virtual landscape on the subsequent day (Kaplan & Haenlein, 2010). Westerman, Spence, and Heide (2014) examined how information in social media affects perceptions of source credibility. They asked participants to view several Twitter pages and report their perceived credibility. The results indicated that the recency of tweets affected their credibility.

## *2.3 Credibility problem of social media information*

Although the credibility of social media information has been extensively researched, little consensus has been achieved on this topic among scholars. Because of the intangible nature of both tourism products/services and the value of time and money, credibility is a major factor in travelers’ decision-making processes. Some researchers have maintained that consumers perceive

social media to be a more credible source of information than service providers (Senecal & Nantel, 2004; Dickinger, 2011), whereas others have stated that social media users are concerned about unreliable information (Schmallegger & Carson, 2008; Fischer & Reuber, 2011). Internet technologies and the development of increasingly powerful mobile devices have improved information availability and accessibility (Kaplan & Haenlein, 2010). Users' collaborative intelligence easily ensures that online information remains up to date (Krishnan, 2013; Mill, 2005). Therefore, up-to-the-minute information is constantly circulated through social media (Westerman, Spence & Heide, 2012). However, Berman (2013) argued that because numerous new messages are constantly posted by Internet users, information becomes outdated quickly; outdated information could cause prompt users to make incorrect decisions because big data cannot be carefully inspected nor a poster's identity be easily verified. Therefore, verifying the credibility of social media information is becoming a challenging problem.

#### *2.4 Heuristic information-processing in travel decision making*

The relevant literature contains extensive discussion on decision making in complex environments. Decision making in such environment often involves risk, ambiguity, and uncertainty. Scholars have proposed various models and theories for addressing risk and uncertainty and identifying effective and efficient decision-making strategies. However, these theories are not always consistent. For example, Kahneman and Tversky (1979) proposed a prospect theory, which is a critique of expected utility theory. Mousavi and Gigerenzer (2014) argued that mathematical calculations may occasionally lose relevance, and that an exhaustive use of information may not be necessary nor feasible. Nevertheless, in most models and

theories, information processing is a vital element of decision-making (Bettis-Outland, 2012). The heuristic information-processing mode was described as an intuitive, experiential, and affective system and the systematic information-processing mode as an analytical and deliberative processing system (Djulgovic *et al.*, 2012). Davis and Tuttle (2013) agreed that systematic processing is information intensive and analytically oriented, whereas heuristic processing is used when people wish to easily acquire and process information for simple decision-making. People tend to change their information-processing strategies to minimize the costs of cognitive effort and judgment inaccuracy (Davis & Tuttle, 2013). Boyd and Bahn (2009) indicated that when consumers are provided with various choices, they may follow a heuristic-based approach for making purchase decisions to save time and alleviate their cognitive burden. Metzger and Flanagin (2013) observed that heuristic processing is typically found in an online context. Jun and Vogt (2013) confirmed that it plays a key role in travel decision-making processes and will be increasingly used because of the emergence of new technologies. Allen (2011) examined police officers' use of information in decision-making processes and observed that most officers used decision-making approaches that relied heavily on intuition. Gigerenzer and Brighton (2009) indicated that three widespread misconceptions exist regarding heuristics: "1. Heuristics are always second-best. 2. We use heuristics only because of our cognitive limitations. 3. More information, more computation, and more time would always be better" (p. 109). They indicated that less information, computation, and time can improve information accuracy.

For travelers, online platforms currently constitute the most popular information source when searching for information relating to their travels, such as flight, travel destination, and hotel information. With the decreasing cost of accessing, producing and disseminating information over communication networks both locally and at overseas destinations, the amount of easily accessible

travel information is increasing remarkably. Confronted with this phenomenon, many travelers use the heuristic information-processing mode both to filter information and to locate the most credible information that meets their needs. For example, Casalo *et al.* (2015) revealed that instead of closely reading other travelers' reviews, travelers tend to check a hotel's online ratings and whether the hotel is one of the best hotels on a list before making a hotel booking. In addition, they revealed that information source creditability affected attitudes and behavioral intention. Travelers have more favorable attitudes toward a hotel and exhibit higher booking intention if the hotel is part of a list published on a well-known online travel community site such as Tripadvisor. The branding of a travel community serves as a heuristic cue for information source creditability, accelerating decision speed and promoting decision confidence. 'Experts can be trusted' is a common heuristic cue that a travel community can comprise experts (Chaiken & Maheswaran, 1994). Other popular heuristic cues provided by many travel review websites include the reviewer's profile and location, their overall and attribute-specific satisfaction ratings, and the review posting time. These cues all play key roles in minimizing cognitive burden and are regarded by users as helpful for judging whether a review is sufficiently credible to allow for a quick decision made with confidence. (Liu & park, 2015; Yin *et al.*, 2014; Yang *et al.*, 2017)

### *2.5 Decision-making speed and confidence*

Confidence can be defined as the degree of belief or judgement that a particular thought or action is correct (Dotan, Meyniel & Dehaene, 2018). When people make travel-related plans, they are not only making decisions but also concurrently evaluating their confidence in each decision (i.e., the likelihood that their decisions are correct or incorrect; Kimuraa *et al.*, 2013). Travelers

collect and review diverse forms of travel information during the initial decision-making stage to reduce uncertainty and enhance their confidence before their final decision (Cox, 2010). Heereman and Walla (2011) conducted two experiments and determined that the stress has differential effects on decision-making confidence, depending on stimulus probability and residual uncertainty (i.e., doubts related to the information relationship); they also observed a negative relationship between decision-making confidence and the reaction time to decisions.

Because of business market volatility, competitive pressures, and uncertainty in contemporary business interactions, tourism and hospitality industry players prefer that travelers to accelerate their decision-making processes (Bettis-Outland, 2012). Persuading consumers to purchase products online is the main aim of the Internet marketers (Ku & Fan, 2009). If travelers make their decisions as rapidly as possible, then the industry players can sell their products to and make money from travelers. Similarly, travelers do not appreciate prolonged uncertainty in their vacation plans, and with improved Internet speeds currently, they easily become impatient. A quick and reliable decision often makes travelers more satisfied than does a slow and unreliable one. A speedy process in a technological application is highly critical to users, as is evident in many domains such as self-service technologies (Collier & Kimes, 2012); online travel agent websites (Lee, Han & Huang, 2017), and e-commerce (Abou-Shouk & Khalifa, 2017). This is understandable as following the continuous improvement in information communication technologies and hardware performance. User expectations regarding server-side information processing have been raised. Harmon (1984) claimed that information characteristics are related to behavior efficiency. Although most studies related to decision-making have not focused on decision-making speed, many studies have briefly mentioned that decision-making environment and approach are related to people's decision-making speed (Casey, 2006; Wong & Yeh, 2009;

Lockenhoff, 2011; Bettis-Outland, 2012). Although information source credibility is a major factor influencing online decision-making (Ayeh *et al.*, 2003), little is known regarding the extent to which it affects decision speed and confidence.

### **3. Hypotheses**

Raghunathan (1999) indicated that the quality of an output (decision) depends on the quality of the input (information) and the quality of the process (the decision-maker's process) that transforms the input into the output. Many studies have demonstrated that both information quality and quantity affect the information-processing strategies deployed by consumers and, subsequently, their actions (Pan, Zhang & Law, 2013).

Highly developed digital technologies do not dramatically alter people's cognitive skills and abilities when evaluating information credibility (Metzger & Flanagin, 2013). However, because of the rapid update of the social media environment, social media information becomes outdated faster than it does in the traditional media environment. Many studies have regarded recency as a dimension of information usefulness (Yang, Zhou & Zhou, 2005). Recency refers to the degree to which the information presented is sufficiently current (Berger & Boritz, 2012). The source and recency of information are widely used to assess the scientific credibility of websites (Kunst *et al.*, 2002). Information recency has been proven to influence people's perceptions of the trustworthiness of online messages and the credibility of the associated websites (Flanagin & Metzger, 2008; Hong, 2005). According to Metzger and Flaganin (2013), recency serves as a determining factor for credibility. If the information is outdated, people check various websites or sources to ensure that the information they require is consistent across the Internet. Accordingly, the current study proposed the following hypothesis.

**H1:** Information recency positively influences perceived social media information credibility.

On the other hand, individual's information processing and decision making often relies on the credibility of the source information. i.e. the level of perceived information credibility leads to different modes of information processing, which, according to Davis and Tuttle (2013), include systematic processing and heuristic processing. Ideally, systematic processing can be applied for rigid decision, but information overload in modern society has rendered this less feasible. So, when people perceive the source of the information as more credible, they often opt for a more economical way of information processing – heuristic processing mode, which has been repeatedly reported (e.g. Sundar, 2008). In addition, some scholars argued that the use of heuristics (at least some categories of heuristics) is based on the premise that the information is credible if a number of people use the information, agree with it, and recommend it (Metzger & Flanagin, 2013). Putting it in another way, when the perceived credibility of information is high (because everybody else is relying on it), the likelihood of using the heuristic processing mode is high. Empirical evidence also suggests that there is a positive correlation between the credibility of the information source and the use of heuristic information processing mode. For example, Trumbo and McComas (2003) investigated people's information processing and risk perception in a medical context and found that the respondents perceived high credibility with public information source (state and industry), which in turn promotes heuristic information processing. In the context of education, Lim (2013) also empirically demonstrated that perceived incredibility is positively linked with the use of heuristic processing among the college students. The opposite is also true. That is, when the perceived credibility is low or when uncertainty of the message increases, the use of heuristics gets lower, and the use of systematic processing increases (Davis and Tuttle, 2013).

Accordingly, this study proposed the following hypothesis:

**H2:** Perceived credibility positively influences heuristic information processing.

Information discreteness and security are paramount on the Internet (Choi & Au, 2011). Credibility is a person's perceptions of a communicator's believability (Nordhagen *et al.*, 2014). When decision-makers are faced with high-risk choices, they may stop at this point and often delay their decision-making for future processing (Roehl & Fesenmier, 1992). This is known as the "expectation violation" heuristic. In a qualitative study involving police officers, Allen (2010) indicated that intuition plays a significant role in the decision-making process and does not negatively influence decision quality. Heuristic processing entails mapping information onto and assimilating information into existing knowledge (Klaczynski, 2001), similar to the confidence-building process. Thus, phenomenologically, judgments that have been made heuristically normally generate a feeling of intuitive correctness in individuals; nevertheless, as indicated by Epstein (1994), the basis for this feeling is often difficult to articulate. Chaiken and Maheswaran (1994) stated that heuristic processing may interfere with reasoning despite conscious attempts to reason analytically. However, Gigerenzer and Brighton (2009) claimed that heuristics can improve decision accuracy. Decision confidence and decision accuracy are different areas. This study focused on decision confidence because travelers are often unaware of the degree of their decision accuracy. Decision confidence connects with customer satisfaction, which is more meaningful than decision accuracy to both industry players and consumers (Kim, 2011). Most researchers have expressed agreement regarding the two primary dimensions of credibility: expertise and trustworthiness (Maddux, 1980). The more expertise social media websites have, the more credible the social media websites are perceived to be, thereby increasing the likelihood of travelers referring to them during their travel-related decision-making process. Heuristics not only

constitute a crucial decision criterion for people browsing hotel-related choices online but also help to increase their confidence during decision-making (Pan *et al.*, 2013).

A study by Griffin *et al.* (2002) has discovered the depth or strength of systematic/heuristic information processing employed by individuals are significantly related to the information cues and subsequent beliefs, evaluations and attitudes. Thus, the correlation-type hypotheses were used in this study and hopefully would reveal more insightful relationships among the proposed constructs measured on a continuous scale.

**H3:** Perceived credibility positively influences travelers' perceived decision-making confidence.

**H4:** Travelers' decision confidence increases with the degree of use of heuristic information processing.

Although decision time has been discussed by many studies, speed or time as a variable has yet to be thoroughly investigated (Casey, 2006). People's decision-making speed differs significantly between virtual and face-to-face environments (Heydari *et al.*, 2011). Communication processes in the virtual environment are comparatively faster because of people's inherently economic information seeking behavior that is facilitated and enhanced by IT technology. Based on human information-processing theories, a heuristic approach is "a fast, associative information-processing mode based on low-effort heuristics" (Chaiken & Trope, 1999, p. ix). Eisenhardt (1989) indicated that the two antecedents of decision-making speed are the number of simultaneous alternatives considered and the presence of experienced counselors. Gigerenzer and Brighton (2009) claimed that a biased mind caused by homo heuristics can handle uncertainty more efficiently compared with an unbiased mind under a rich resource condition. Del Campo, Pauser, Steiner, and Vetschera (2016) stated that the heuristic is an efficient rule of thumb.

Studies on decision time have focused either on actual time measured in experiments (Shi, 2012) or on perceived time measured on scales (Casey, 2006). Perceived decision speed was used in this study. It refers to how fast an individual feel to make a decision has been made. Real decision-making time is defined as the amount of time actually taken to make a decision (Casey, 2006). To effectively examine the effects of a heuristic approach, this study used both perceived speed and real time in the conceptual model and proposed the following hypotheses:

**H5a:** Travelers' perceived decision speed increases with the degree of use of heuristic information processing.

**H5b:** Travelers' real decision time decreases as the degree of use of heuristic information processing increases.

The foregoing discussion constitutes the theoretical framework (Fig. 1.) of this study. This discussion outlines that information recency is an antecedent of credibility. Moreover, social media information credibility triggers travelers' heuristic information processing, thus influencing their real decision time, perceived decision-making speed and confidence.

\*\*\*\*\*Please insert Fig. 1. here\*\*\*\*\*

#### **4. Method and results**

Studies have revealed that both information and factors such as emotion, motivation, and experience influence human information-processing modes (Dinsmore & Parkinson, 2013). Some situational factors affect human information processing as well. Time pressure was among them (Hilbig, Erdfelder & Pohl, 2012). Because this study primarily focused on the impact of information credibility characteristic on perceived decision-making speed and actual decision time,

online survey was selected instead of lab experiment was selected to reduce respondents' time pressure. Moreover, research recommended measuring items in a context that is similar to that in which the corresponding real-life behavior is expected to occur (Ajzen & SextonNe, 1999). Therefore, data were collected through an online survey in a field setting. The survey instrument started with two filter questions used to determine whether the respondent was an active social media patron with a holiday plan: (i) "Do you have plans for a leisure holiday in the next 6 months?" and (ii) "Have you ever used travel-related social media (such as Tripadvisor.com) for your previous holiday plan?" To avoid any misunderstanding of the term 'travel-related social media', the following definition of social media is provided with this question: it refers to a group of Internet-based applications for tourism planners and tourist product consumers using Web 2.0 and containing user-generated content such as trip experiences sharing, reviews, photos, videos (Kaplan & Haenlein, 2010).

According to China Internet Network Information Center (CNNIC) report (2019), China has 410 million (48.9% of the total net users) online travel bookers, 30.3% of whom are hotel costumers. Leisure tourism booking constitute 56% of hotel bookings in China (CNNIC, 2015). Therefore, we selected Chinese leisure tourism consumers as the target sample population in this study; we believe that examining samples in a country with rapidly increasing Internet use might offer insights into behaviors observed elsewhere. The survey respondents were instructed to select a hotel that they had never visited for their upcoming leisure holiday after browsing one randomly selected social media website (you.ctrip.com [user-generated content channel belonging to China biggest online travel agency]; go.taobao.com [in Study 1; tourism channel with user-generated content belonging to Alibaba.com] / tripadvisor.com [in Study 2]; or mafengwo.com [similar to TripAdvisor and popular among Chinese users]). These websites were selected because of their

popularity among Chinese travelers (CNNIC, 2015; CNNIC, 2019). Study 1 collected data in 2016 and Study 2 collected data in 2019 to further confirm the model and results from Study 1. In both studies, the respondents were requested to start responding to the questionnaire once they had clicked the hotel booking icon on deciding which hotel to choose. The exact length of browsing time used until clicking the booking decision icon was tracked by the survey company (Sojump.com) and this was used as a proxy for real decision time. There is no time limit imposed on the respondents for net surfing. Sojump.com is China's largest online survey company and is believed to have credible procedure in data collection. The reason for selecting more than one website as a scenario was to reduce the potential credibility bias caused by using a single website. In Study 2, go.taobao.com was replaced by tripadvisor.com owing to the rapid market expansion of Tripadvisor in China in the previous 3 years.

#### *4.1. Study 1*

##### *4.1.1. Sample*

The sample comprised 372 respondents, and male and female respondents constituted 37.1% and 62.9% of the sample, respectively. A majority of the respondents were in the 30–39-year age group (54%). Moreover, 88.5% of the respondents had more than 3 years of experience with social media. Upscale and upper upscale hotels were the preferred hotel groups among the respondents (86.18%).

\*\*\*\*\*Please insert Table 1 here \*\*\*\*\*

##### *4.1.2 Measures*

The questionnaire was rated using a 7-point Likert Scale. The measurement items for the questionnaire variable—namely perceived information recency (Shen, Cheung & Lee, 2012), perceived credibility (Ohanian, 1991), heuristic approach (Trumb, 1999; Griffin *et al.*, 2002),

perceived decision-making speed (Cox, 2010; Wong & Yeh, 2009), and decision-making confidence (Visser, Krosnick & Simmons, 2003; Tuu, Olsen & Linh, 2011)—were developed by referring to the tourism marketing, psychology, and business administration literature. Perceived recency was refined to discover the degree to which an individual would consider the presented information to be sufficiently current (Berger & Boritz, 2012). Four items were generated from a previous study conducted on social media (Shen *et al.*, 2012). Perceived credibility was operationalized as the extent to which an individual would consider the sources and contents of customer generated media (CGM) (i.e. the travelers who post content and the content itself, respectively) as a whole to be believable. Two most commonly accepted dimensions, namely expertise and trustworthiness, were adopted in this study as subscales of perceived credibility. For these subscales, a seven-item measurement scale is adapted from Ohanian (1991). Heuristic processing approach has been developed and used several times in previous empirical research. Trumb's (1999) study is among the earliest published applications of the heuristic processing within the context of risk perception and one of the earliest studies to use observational data. He generated two items for this approach. Griffin, Neuwirth Giese and Dunwoody (2002) developed another item based on Trumb's (1999) work. Their study was the first to link heuristic processing with elements of the theory of planned behaviour in a field setting. Yang *et al* (2010) adapted the two items used by Trumb (1999) to their clinical trial. This study included all five items and amended them for the travel and social media context. Perceived decision-making speed was considered subjective time and operationalized as a person's perceived speed (fast or slow) in making a decision. Four items adapted from Cox (2010) were used to measure perceived decision speed. Cox originally used the items in his online survey to check the impact of business intelligence systems on decision making. Decision confidence was operationally defined as a

traveler's perceived strength of belief about the correctness of a judgment or choice regarding a tourism product. It is part of the consumer attitude intention literature and is well-established construct (Bennett & Harrell, 1975; Laroche *et al.*, 1996). The present study adopted four items sureness, firmness, liking, and comfort from Visser *et al.* (2003) and Tuu *et al.* (2011) to measure decision confidence.

Table 2 presents the items and their respective sources.

\*\*\*\*\**Please insert Table 2 here*\*\*\*\*\*

The items were originally written in English. Because all target respondents were ethnically Chinese people, this study adopted a back-translation- procedure to translate the items. Back-translation is useful for situation that require particular attention to sensitive translation problems across cultures (Behr, 2017). Three bilingual professionals were invited to verify the consistency of the items. Five conveniently selected bilingual doctoral students helped to test the questionnaire.

The survey instrument was pilot-tested with 152 hotel customers. On the basis of the results of the pilot study as well as observations made during the questionnaire administration process, some revisions were required in the measurement instrument. Two items, namely V6 (“Determine whether this person is qualified or unqualified to offer travel advice”) and V7 (“Determine whether this person is skilled/unskilled in travel”), under the expertise dimension had low factor loadings (<.5); therefore, these items were deleted from the main questionnaire. Moreover, items H1 (“When I come across social media information about a hotel for vacation on this site, I focus on only a few key factors”) and H2 (“When I see or hear information about a hotel for a vacation, I do not mind spending time thinking about it”) under the construct heuristic approach were not significant in the pilot study. However, Babbie (2011) suggested that to conduct structural equation modeling

(SEM), at least four items for each construct can provide improved results. Because the reliability of the construct heuristic approach was comparatively lower than that of the other constructs, these two items were retained in the main questionnaire. A total of 372 questionnaires were collected, with a response rate of 15.1%.

#### *4.1.3 Measurement model*

Confirmation factory analysis (CFA) is the first stage of SEM and enables researchers to assess whether a theoretical measurement model is valid (Hair et al., 2011). In this study, the selected fit indices of the proposed measurement model indicated a reasonable level of fit:  $\chi^2 = 167.720$ ,  $df = 123$ ,  $p < .01$ , root mean residual (RMR) = .033, goodness-of-fit index (GFI) = .953, comparative fit index (CFI) = .987, Tucker–Lewis index (TLI) = .984, and root mean square error of approximation (RMSEA) = .031 and standardized RMR (SRMR) = .027. These figures indicate that the proposed model is acceptable.

Estimated loadings provide a useful foundation for assessing the convergent validity of a measurement model; a factor loading threshold of .50 or ideally .70 can be set for assessment (Hair *et al.*, 2011). In this study, H1(“When I come across social media information about a hotel for vacation on this site, I focus on only a few key factors”), H2(“When I see or hear information about a hotel for a vacation, I do not mind spending time thinking about it”), or H4 (“I have been able to make a decision about this hotel based on my prior knowledge and experience”) did not meet the factor loading threshold of .50 (all factor loadings were below .50). By contrast, all other loading estimates were above .50. Although the loading estimates obtained for the construct heuristic approach were slightly below .70, this did not significantly affect the model fit or its internal consistency (Hair et al., 2011). The AVE of the Heuristic construct was slightly lower than

the good rule of thumb ( $AVE = .478 < .50$ ). A common approach to improving the AVE is to modify the construct until it reaches the .50 cutoff point (Anderson & Gerbing, 1988). However, excessive construct modification could result in an arbitrary measurement scale with limited application value to other studies and contexts. Four approaches are commonly applied to assess the discriminant validity (Matthes & Ball, 2019). The most common approach is the method suggested by Fornell and Larcker (1981); in this method, to achieve discriminant validity, the square root of the AVE of each construct must be greater than the correlation of this construct with any of the other constructs. Accordingly, our test results indicated adequate convergent and discriminant validity for the proposed CFA model.

\*\*\*\*\*Please insert Table 3 here\*\*\*\*\*

\*\*\*\*\*Please insert Table 4 here\*\*\*\*\*

#### 4.1.4 Structural model

According to Hair et al. (2011), the next stage of SEM is to evaluate a structural model's validity. The whole-model fit was first assessed, followed by examining the structural relationships for their consistency with theoretical expectations. The  $\chi^2$  value was 257.959, with the corresponding df being 130 ( $p < .001$ ), and the normed  $\chi^2$  value was 1.984. The model GFI and CFI were .930 and .964, respectively, and the RMSEA and 90% confidence interval were .052 and .041–.059, respectively; the SRMR was .053. All these measures are within a range associated with a good model fit, thus demonstrating the model to exhibit a good overall fit.

The results revealed that perceived information recency significantly affected perceived credibility on social media ( $\beta = .828$ ,  $t = 11.005$ ,  $p < .001$ ) and that perceived credibility significantly affected the use of heuristic processing mode ( $\beta = .919$ ,  $t = 9.177$ ,  $p < .001$ ). Perceived

credibility significantly affected travelers' perceived decision-making confidence ( $\beta = .453$ ,  $t = 6.975$ ,  $p < .001$ ). Moreover, the effects of heuristic processing on perceived decision-making confidence ( $\beta = .546$ ,  $t = 6.357$ ,  $p < .001$ ) and perceived decision-making speed ( $\beta = .949$ ,  $t = 9.742$ ,  $p < .001$ ) were noted to be significant. Therefore, H1, H2, H3, H4, and H5a were supported. However, the relationship between heuristic processing and real decision time was not significant.

\*\*\*\*\*Please insert Fig 2. here \*\*\*\*\*

This study tested the mediating role of heuristic processing in the relationship between perceived credibility and decision-making confidence. According to the procedures described by Hair *et al.* (2011), this study examined both the direct effect (i.e., perceived credibility on perceived decision-making confidence) and indirect effect (i.e., perceived credibility on perceived decision-making confidence through heuristic processing) of the mediating variable. The direct effect of perceived credibility on perceived decision-making confidence ( $\beta = .807$ ,  $t = 13.397$ ,  $p < .001$ ) was significant. The indirect effect through heuristic processing was reduced by still found to be significant ( $\beta = .475$ ,  $t = 4.203$ ,  $p < .001$ ). The bootstrapping procedure was adopted for further mediation analysis, as recommended by Byrne (2009). The results indicated that the indirect effect of perceived credibility on decision confidence through heuristic processing was significant (0.333\*\*). The direct effect of perceived credibility on decision confidence was also significant (0.490\*). Thus, the link between perceived credibility and decision confidence was partially mediated by heuristic processing.

\*\*\*\*\*Please insert Table 5 here \*\*\*\*\*

\*\*\*\*\*Please insert table 6 here \*\*\*\*\*

#### 4.2 Study Two

#### *4.2.1 Sample*

To validate the results from study 1, we conducted a second round of data collection in June 2019. The questionnaire was again distributed through Sojump as the major data collection channel, supplemented by convenience sampling. Thus, 217 responses (74.57%) were collected through Sojump and 71 (25.43%) through convenience sampling offline. Accordingly, a total of 291 responses were collected from Chinese-speaking respondents (a 46.1% response rate). After data screening, 282 were retained for analysis (Table 1). The sample comprised 35.5% men and 64.5% women. The majority of the respondents were aged between 20 and 39 years, with 41.8% being aged between 20 and 29 years and 40.4% between 30 and 39 years. Moreover, 68.1% of the respondents had more than 5 years of experience with social media. Midscale and upscale were the preferred (68.8%) hotel types.

#### *4.2.2 Measurement model*

In Study 2, the selected fit indices of the proposed measurement model indicated a reasonable level of fit:  $\chi^2 = 223.265$ ,  $df = 125$ ,  $p < .001$ ,  $RMR = .054$ ,  $GFI = .918$ ,  $CFI = .949$ ,  $TLI = .938$ ,  $RMSEA = .053$ , and  $SRMR = .048$ . These statistics indicate that the proposed model is acceptable.

As presented in Table 4, all AVE estimates in Study 2 were statistically appropriate. Study 2 therefore also revealed adequate convergent and discriminant validity for the proposed CFA model.

#### *4.2.3 Structural model*

The  $\chi^2$  value was 271.780, with the corresponding  $df$  being 130 ( $p < .001$ ), and the normed  $\chi^2$  value was 2.091. The model  $GFI$ ,  $TLI$ , and  $CFI$  were .903, .913, and .926, respectively, and the

RMSEA and 90% confidence interval were .062 and .052–.073, respectively; the SRMR was .073. All of these measures are within ranges associated with a good model fit, thus further demonstrating that the model exhibited a good overall fit. Additionally, most paths exhibited the same significance exhibited in Study 1. Although the significance of the path coefficient from perceived credibility to confidence was reduced from  $<.001$  significance to  $<.05$ , the hypothesis remained supported ( see Table 5 for details).

In Study 2, the mediating role of heuristic processing was also examined using the same strategy adopted in Study 1. The direct effect of perceived credibility on decision confidence ( $\beta = .648$ ,  $t = 9.042$ ,  $p < .001$ ) was significant. The indirect effect through heuristic processing was nonsignificant. The bootstrap results showed that the indirect effect of perceived credibility on decision confidence through heuristic processing was significant (0.496\*\*). The direct effect effect of perceived credibility on decision confidence was also nonsignificant. Thus, the relation between perceived credibility and decision confidence was fully mediated by heuristic processing.

\*\*\*\*\*Please insert Fig. 3. here \*\*\*\*\*

### 4.3 ANOVA-based Analysis

Although we attempted control cognitive factors through task design, the identified effects should be checked statistically for consistency with previous studies. We conducted ANOVA to assess group differences regarding a dependent variable (Hair *et al.*, 2011) and not to compare or further validate the model; hence, we combined data from both studies for the analysis. In this analysis, age, experience and familiarity, which are commonly studied cognitive factors influencing heuristic approach and decision making (e.g. Lockenhoff, 2011; Dinsmore & Parkinson, 2013), were selected.

#### *Age*

Participants aged between 20 to 39 years constituted the majority (82.4%) of the 654 samples. The one-way ANOVA test was conducted to determine the effect of age on heuristic processing,

perceived decision speed and decision confidence. The results indicated that travelers' heuristic processing mode ( $F = 2.944, p < .05$ ), perceived decision-making speed ( $F = 7.635, p < .001$ ) and decision confidence ( $F = 4.425, p < .01$ ) differed significantly across age. Post hoc analysis results indicated that 30- to 39-year age group typically varied from the younger groups in terms of all three constructs.

\*\*\*\*\*Please insert Table 7 here\*\*\*\*\*

\*\*\*\*\*Please insert Table 8 here\*\*\*\*\*

### *Social media experience*

The majority of the participants were very experienced social media users (366 participants had more than 5 years of experience using social media). We observed that this experience had a significant effect on decision confidence ( $F = 10.591, p < .001$ ) but not on the use of the heuristic approach or perceived decision speed.

### *Site familiarity*

Most (76%) of the participants were at least somewhat familiar with all the referenced websites. The results indicated that site familiarity positively influenced heuristic processing ( $F = 7.688, p < .001$ ), perceived decision speed ( $F = 13.801, p < .001$ ) and decision confidence ( $F = 18.435, p < .001$ ). Those unfamiliar with or neutral toward the websites differed from other groups on all three constructs. Four groups (from extremely unfamiliar to familiar extent) out of total seven groups varied significantly in decision confidence.

## **5. Discussion**

This study primarily explored the effect of perceived credibility on travelers perceived decision-making speed, actual time, and perceived decision-making confidence under the mediating effects of heuristic information processing in the social media context. The findings

confirm those of previous studies that have demonstrated that information recency is associated with perceived credibility (Kunst *et al.*, 2002; Flanagin & Metzger, 2008; Hong, 2005). Only up-to-date information is considered useful.

With the increasing amount of continually updated information on social media sites, decision speed is becoming critical for users who base their decisions on such information (Roehl & Fesenmier, 1992; Bettis-Outland, 2012). Numerous studies on human information processing have reported that the heuristic information-processing mode is typically more time efficient than other approaches, particularly during the processing of information from the Internet (Sundar, 2008). The SEM results support this report and demonstrate that heuristic approach significantly affected travelers' perceived decision-making speed. The more frequently or extensively people use the heuristic mode, the more frequently they perceive that their decision-making speed is higher.

In this study, the inclusion of decision confidence as a variable for comparison with decision speed was crucial because it enables us to determine how information characteristics would affect each one of them separately. Furthermore, well-established theories indicate a positive effect of heuristic processing on decision speed; nevertheless, not many previous studies have explored how information credibility may affect decision confidence through heuristic processing. Because open and updated information is provided on social media, the amount of information exceeds the human brain's processing capacity. However, travelers are rarely concerned about this when making decisions. The reason may lie in the delicate mechanism of the human brain. Hilbert (2012) claimed that the human brain can retain an adequate amount of information. The notion that people use heuristics only because of their cognitive limitation is a misconception (Gigerenzer & Brighton, 2009). More information, computation, and time would not always be better (Gigerenzer & Brighton, 2009), particularly in the online context. Gigerenzer (2008) stated a crucial discovery

that simple heuristics can be more accurate than complex procedures. The results of the current study are thus in line with those of previous studies. Heuristic processing can enhance travelers' decision-making confidence. Furthermore, our bootstrap results indicate that the mediating effect of heuristic processing was enhanced between the two studies: from a partial mediator in Study 1 (2016) to a full mediator in Study 2 (2019). Travelers in China are becoming more experienced. The rapid expansion of the popular travel websites in the previous 3 years has also assisted with travelers' site familiarity. Thus, the trend for travelers to follow the thumb rule of heuristic processing is becoming powerful. The results further demonstrate the necessity of introducing heuristic processing as a model construct.

According to the path coefficients, the effect of heuristic processing on perceived decision speed ( $\beta = .919$  in study 1;  $\beta = .453$  in study 2) was stronger than that on decision confidence ( $\beta = 0.698$  in study 1;  $\beta = .216$  in study 2). This further indicates that our theoretical framework that we established by focusing on the impact of information credibility on perceived decision speed is well-designed and consistent with the literature. Heuristic processing positively influences perceived decision speed more than it does on decision confidence.

The findings of this study also indicate that the commonly used dimensions of credibility did not fit the social media context. Credibility scales in published research have two dimensions, namely perceived expertise and perceived trustworthiness. However, the scales for measuring perceived expertise were discarded in this study because of their low factor loadings. This suggests that, with respect to social media information, travelers tend to judge perceived credibility according to the content of the related post, regardless of whether the post has been made by an expert or a layman. The mean value of the respondents' scores for perceived credibility was high

(M = 5.689). This suggests that although social media information exhibits certain problems and is often debated among researchers, it is perceived as credible by most travelers.

This study included both real decision time and perceived decision-making speed as model constructs in order to test whether the two measures of time were parallel in an out-of-lab environment. Although the results indicate a negative relationship between heuristic processing and real decision time, the relationship was not statistically significant. Net surfing action was difficult to control. Individuals' behavior may differ extensively in terms of decision time within a given choice setting (Lockenhoff, 2011). Some may have continued to browse the site after making the hotel-booking decision, and the online survey company could track only the respondents' browsing time on the entire website due to the technological limitation. Stubb (2018) compared a storytelling message format and information message format in terms of readers' online viewing times. He discovered that using a storytelling message format increases the viewing time of a sponsored blog post. Most social media websites provide travel story sharing. This suggests that respondents normally perceive their decision time to be short. Furthermore, Chaiken *et al.* (1989) argued that the impact of heuristic cues is often negligible in settings that promote systematic processing. Because systematic processing typically provides observers with more judgment-relevant information than heuristic processing provides, unambiguous subject content implies that systematic processing will be dominant. This helps explain why the link between heuristic processing and real decision time was nonsignificant, as such time can be objectively measured and is less difficult to obtain.

According to the ANOVA results, cognitive factors (in this study, age, social media experience, and site familiarity) are powerful influencing factors in this model. Prior studies have determined that age is related to processing speed and decision time (e.g. Mata & Nunes, 2010).

Older adults need more time to review individual pieces of information but have a shorter decision time than younger adults do due to their richer experiential knowledge (Lockenhoff, 2011). Therefore, the finding that that age was significantly related to heuristic processing, perceived decision speed and decision confidence is not surprising. Early in the 1990s, Gerontol's experimental results indicated that the total time to reach a decision does not differ by age, but older people tend to be better capable of reducing cognitive effort when arriving at a decision. Lockenhoff (2011) also indicated that advanced age is related to a preference for the heuristic approach. This study confirms this finding: the eldest group (50-59 years) had the highest mean score in both heuristic processing and perceived decision speed.

Uncertainty in the mind of a consumer directly influences their behavior (Bonsall, 2004). Experience and familiarity reduce a consumer's perception of uncertainty. Our results demonstrate that social media experience was positively related to decision confidence and that site familiarity in particular was positively associated with all three constructs: heuristic processing, perceived decision speed, and decision confidence. This further proves that having prior experience with a product triggers heuristic processing to map and assimilate information into existing knowledge in decision making (Klaczynski, 2001).

## **6. Implications**

The findings of this study offer significant theoretical contributions to the online decision-making literature. Although most studies have focused on the importance of credibility, the current study explored the underpinning heuristic processing mode as a mediator of the relationship between perceived credibility and decision confidence. The processing procedure plays a mysterious but important role in decision making. The significant path effect of heuristic mode on

decision confidence in this study contributes to the less studied relations among perceived credibility, heuristic mode and decision confidence. Some papers find that consumers perceive social media to be more credible than information from service providers (Senecal & Nantel, 2004; Dickinger, 2011), while others state that there are some concerns about the validity of information (Schmallegger & Carson, 2008; Fischer & Reuber, 2011). This study proves that travelers generally perceive information found on social media as credible. The results confirm the prominence of information recency in the social media environment. Information recency is an antecedent of travelers' perceived credibility. Finally, the credibility scales in published research have two dimensions, namely perceived expertise and perceived trustworthiness. However, with respect to social media information, only trustworthiness improves perceived credibility.

This study also contributes to existing research by employing a new research approach. Prior studies largely examined the human information processing theories (e.g. Jun & Vogt, 2013; Bao *et al.*, 2011; Chaiken, 1980) and decision confidence (e.g. Dinsmore & Parkinson, 2013; Heereman & Walla, 2011; Haynes, 2009) and speed (e.g. Shi, 2012; Heydari *et al.*, 2011; Mata & Nunes, 2010; Wong & Yeh, 2009) with controlled experiments and student samples. Although these approaches offer insightful results affecting both theory and practice, they may raise concerns regarding sample representativeness and generalizability. The present study successfully used survey methods to collect data from real travelers. This will strengthen the significant role of human information processing mode in affecting decision speed and confidence.

The findings equally have substantial managerial implications. Perceived decision speed can influence online customer satisfaction (Ling *et al.*, 2016). Because of the observed role of heuristic processing in improving customers' perceived decision speed and confidence, encouraging customers to use heuristic processing is vital for businesses. This study revealed a significant

relationship between perceived credibility and the use of the heuristic information-processing mode. If tourism marketers can improve the quality of heuristic cues or the credibility of information, travelers are more likely to use heuristic processing; consequently, the following heuristics (at minimum) will be promoted: reputation, endorsement, and consistency heuristics (Jun & Vogt, 2013). Tourism industry practitioners can provide updated information and other sufficient heuristics on their websites to help trigger customers' heuristic processing and more travel stories to retain customers and reduce their perceived decision time. We suggest that tourism companies implement several strategies to improve the heuristic cues on their social media platforms. For example, marketers can encourage customers to post more user-generated content either to evaluate the product or service they have enjoyed or to share an experience in verbal, picture, or even video format. Moreover, companies can establish an online community for interactive information sharing among travelers. Tourism companies can also make instant responses to any comments made regarding their products and service on these online platforms, portray genuine care, make clarifications whenever necessary, and provide updated information.

On the other hand, the dropped expertise dimension under the credibility variable indicates that online marketing managers should carefully consider the content of posts on their social media websites. They may not be required to invest excessive funds in inviting "experts" to write and share travel stories on their websites; nevertheless, the marketing managers can provide incentives or a scoring system for travelers to readily share their travel experiences with interesting substance in a timely manner.

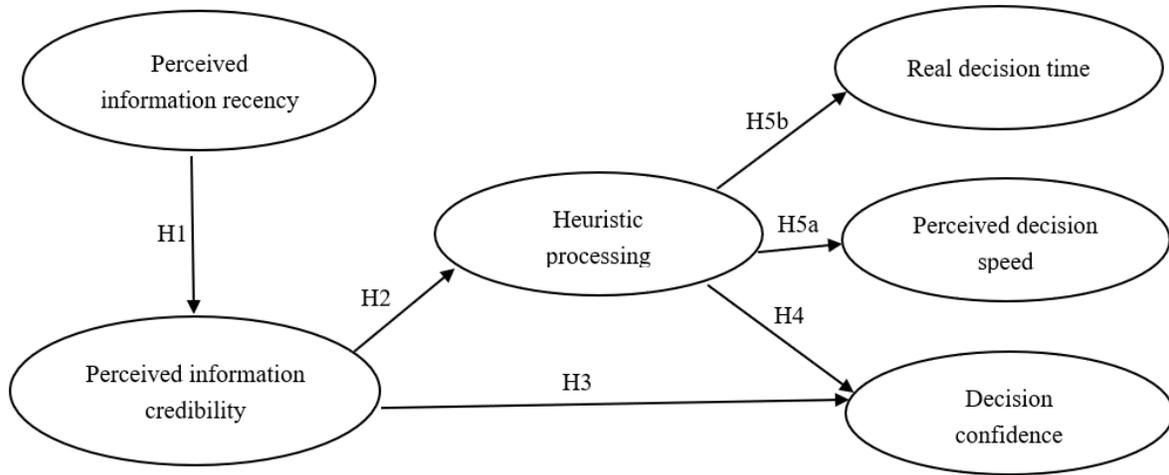
## **7. Conclusion, limitations and further research**

In sum, the present study provides an exposition of how a heuristic approach to decision making can lead to faster, more confident decisions on social media in the context of hotel shopping. Our findings provide both scholars and industry players with an in-depth understanding of the importance of information recency and credibility in travelers' decision-making processes.

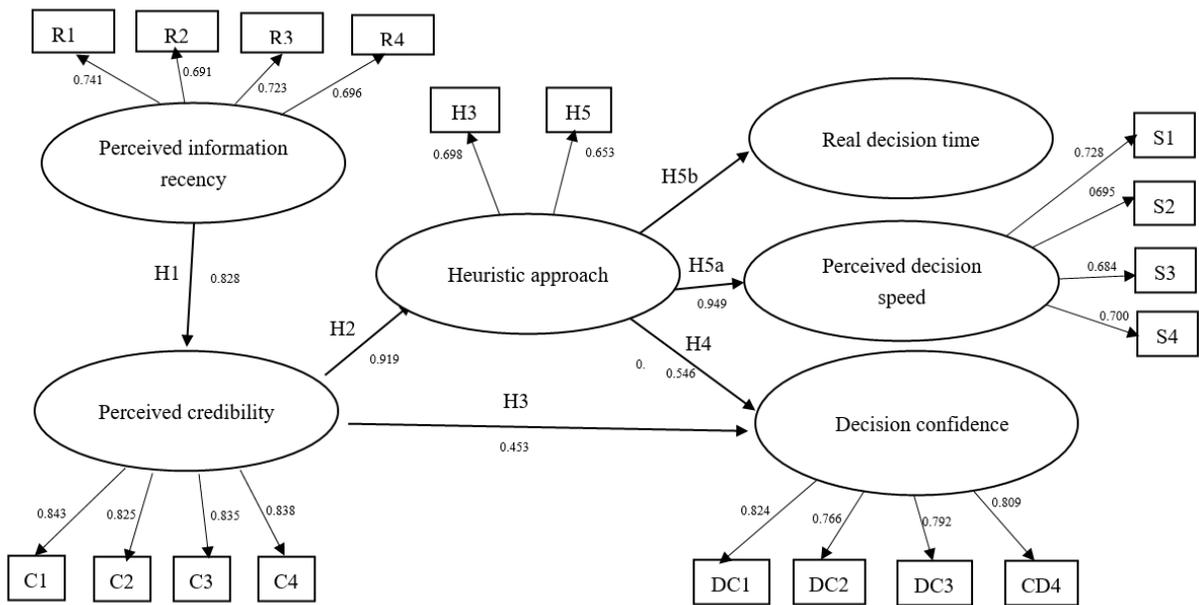
Previous studies on online consumer behavior have relied on the technology acceptance model (Davis, 1989; Moon & Kim, 2001; Koufaris, 2002). However, the expansion of IT in the business environment has encouraged people to view news and other information on computers or mobile devices. The acceptance of IT is no longer a major concern. Thus, the content and variety of online information, along with its influence, should be investigated. This study drew on this research trend and investigated mainly perceived credibility in social media. The successful adoption of heuristic processing theory from the field of psychology for application to travel behavior bridges the two areas and provides another tool to tourism researchers. The results also indicate that in addition to well-known cognitive factors such as motivation, information itself can affect decision speed and confidence through its influence on the heuristic processing mode. Although real decision time was not associated with heuristic processing, the relationships among perceived credibility and decision speed and confidence were proven to be mediated by heuristic processing. Overall, this study offers a valid theoretical framework for future research.

The primary limitation of this study is the online decision time-tracking technology. The use of the tracked net surfing time to replace the real decision time in this study may not provide sufficiently rigorous results. Ideally, real decision-making processes should be tracked (rather than tracking the net surfing time) so that the real decision time can be recorded more accurately. At present, financial and operational constraints mean that this limitation has remained. Further research may consider designing web pages with different levels of credibility cues to improve the

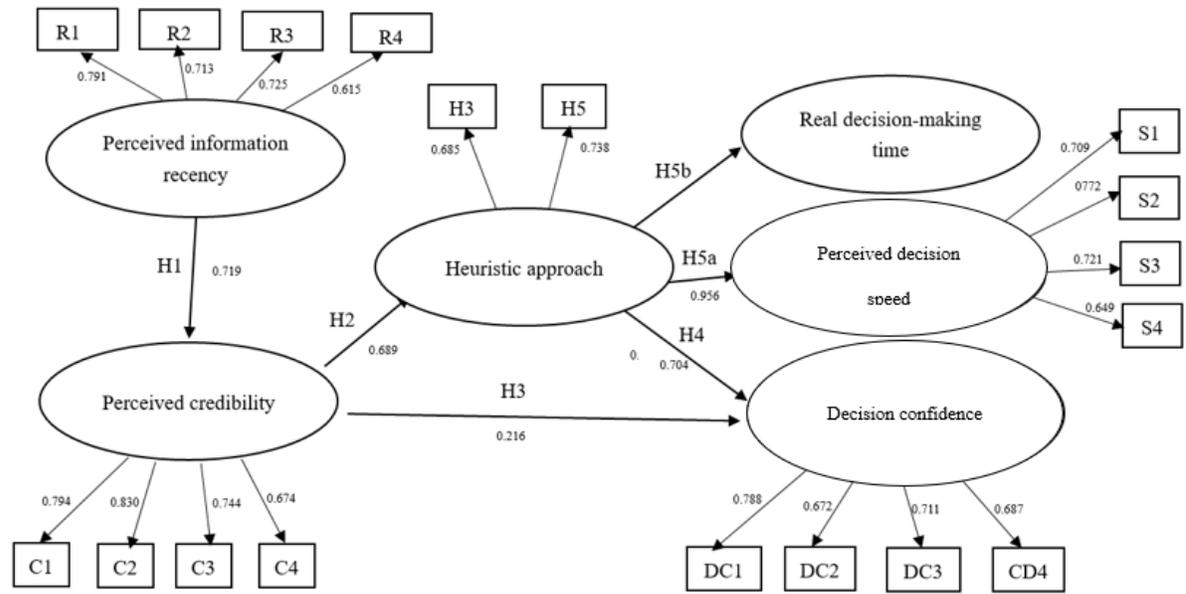
understanding of travelers' involvement in heuristic information-processing in an experimental environment. Future studies can consider designing instruments to track participants' real decision time to examine the effect of the heuristic approach. According to previous studies, there exists various types of heuristics exist (Gigerenzer & Brighton, 2009; Metzger & Flanagin, 2013). Further studies may identify the effectiveness of each type. The correlations among heuristics, credibility judgement and heuristic processing also needs to be further justified and examined in future research. Finally, this study was conducted in a Chinese context only. Future studies may test this model in other cultural contexts to compare results and assess the generalizability of the findings.



**Fig. 1.** Theoretical framework



**Fig. 2.** Structural Model of Study 1



**Fig. 3.** Structural Model of Study 2

**Table 1**

Profile of participants of the survey

Dimension	Category	Study 1 (N=372) Percentage (%)	Study 2 (N=282) Percentage (%)
Gender	Male	37.1	35.5
	Female	62.9	64.5
Age	<19	0	8.9
	20-29	28.5	41.8
	30-39	54	40.4
	40-49	15.9	6.4
	50-59	1.3	2.5
	>60	.3	0
	<1	2.2	3.9

Dimension	Category	Study 1 (N=372) Percentage (%)	Study 2 (N=282) Percentage (%)
Years of Social media usage	1-2	9.4	52.1
	3-5	41.70	52.10
	>5	46.80	7.10
Hotel preference	Luxury	3.33	.40
	Upper upscale	30.95	9.60
	Upscale	51.90	27.70
	Midscale	12.86	41.10
	Economy scale	.95	21.30
Travel accompanies	Alone	3.20	3.50
	Partners	30.60	30.10
	Family	51.60	45.00
	Friends	14.50	21.30
Education	High school	.50	1.40
	College diploma	3.80	5.00
	Bachelor's degree	61.00	85.5
	Master's degree or above	34.70	8.20
Annual income family	<20,000	1.90	6.40
	20,001-50,000	5.40	16.70
	50,001-100,000	18.30	35.50
	100,001-200,000	42.20	34.00
	200,001-500,000	25.00	5.30
	500,001-1,000,000	5.60	2.10

Dimension	Category	Study 1 (N=372) Percentage (%)	Study 2 (N=282) Percentage (%)
	>1,000,000	1.60	0.00

**Table 2**

Variable measurement items

Variable	Measurement item	Source
Perceived information recency	R1: The social media information that I read on this website is always up to date.	Shen <i>et al.</i> , 2012
	R2: I observe that the website allows users to give/receive timely feedback to/from other travelers.	Shen <i>et al.</i> , 2012
	R3: I observe that the information provided on this website is updated very frequently.	Shen <i>et al.</i> , 2012
	R4: The travel stories, comments, or pictures provided on this website are up to date.	Shen <i>et al.</i> , 2012
Perceived credibility	<i>Trustworthiness dimension:</i>	
	C1: Dependable/undependable	Ohanian, 1991
	C2: Honest/dishonest	Ohanian, 1991
	C3: Reliable/unreliable	Ohanian, 1991
	C4: Sincere/insincere	Ohanian, 1991
	C5: Trustworthy/untrustworthy	Ohanian, 1991
	<i>Expertise dimension:</i>	
C6: Determine whether people are qualified to offer travel advice/unqualified to offer travel advice.	Ohanian, 1991	
C7: Determine whether people are skilled/unskilled in travel.	Ohanian, 1991	
Heuristic approach	H1: When I come across social media information about a hotel for vacation on this site, I focus on only a few key factors.	Yang <i>et al.</i> , 2005
	H2: When I see or hear information about a hotel for a vacation, I do not mind spending time thinking about it.	Yang <i>et al.</i> , 2005
	H3: There is considerably more information about hotels for a vacation than I personally require.	Griffin <i>et al.</i> , 2002

	H4: I have been able to make a decision about this hotel based on my existing knowledge and experience.	Trumb, 1999
	H5: On this issue, I am willing to place my trust in the experts and go with their recommendation.	Trumb, 1999
Perceived decision speed	S1: Using the information presented by this website, I can quickly filter information.	Cox, 2010
	S2: Using the social media information makes it easier for me to reach a hotel booking decision.	Cox, 2010
	S3: The social media information on this website helps me make fast decisions.	Cox, 2010
	S4: The social media information on this website shortens the time frame for my decision making to a great extent.	Cox, 2010
Real decision time	<i>Tracked site surfing time</i>	
Decision confidence	DC1: Sure/unsure	Visser, Krosnick, & Simmons, 2003
	DC2: Firm/shaky	Visser, Krosnick, & Simmons, 2003
	DC3: Liking/disliking	Tuu <i>et al.</i> , 2011
	DC4: Comfortable/uncomfortable	Tuu <i>et al.</i> , 2011

**Table 3**

Results of CFA

Factors	Factor Loading	
	Study 1	Study 2
<b>Factor 1: Perceived information recency (R)</b>	<b>(<math>\alpha = 0.805</math>)</b>	<b>(<math>\alpha = 0.805</math>)</b>
R1: The social media information that I read on this website is always current.	.741	.791
R2: I observe that the website allows users to send/receive timely feedback to/from other travelers.	.691	.713

Factors	Factor Loading	
	Study 1	Study 2
R3: I observe that the information provided on this website is updated frequently.	.723	.725
R4: The travel stories, comments, or pictures provided on this website are up to date.	.696	.615
<b>Factor 2: Perceived credibility (C)</b>	<b>(<math>\alpha = 0.902</math>)</b>	<b>(<math>\alpha = 0.847</math>)</b>
C2: Honest	.843	.794
C3: Reliable	.825	.830
C4: Sincere	.835	.744
C5: Trustworthy	.838	.674
<b>Factor 3: Heuristic approach (H)</b>	<b>(<math>\alpha = 0.627</math>)</b>	<b>(<math>\alpha = 0.656</math>)</b>
H3: There is considerably more information regarding hotels as places to stay while on vacation than I personally require.	.698	.658
H4: I have been able to make a decision about this hotel based on my prior knowledge and experience.	-	-
H5: On this issue, I am willing to place my trust in the experts and go with their recommendation.	.653	.738
<b>Factor 4: Perceived decision speed (S)</b>	<b>(<math>\alpha = 0.795</math>)</b>	<b>(<math>\alpha = 0.815</math>)</b>
S1: I can quickly filter the information presented on this website.	.728	.709
S2: Using social media information makes it easier for me to reach a hotel booking decision.	.695	.772
S3: The social media information on this website helps me make my decisions rapidly.	.684	.721
S4: The social media information on this website substantially shortens the time frame for my decision-making.	.700	.649
<b>Factor 5: Real decision time (RDT)</b>		
Using tracked websites to browse the traveler's decision time.	-	-
<b>Factor 6: Decision confidence (DC)</b>	<b>(<math>\alpha = 0.875</math>)</b>	<b>(<math>\alpha = 0.807</math>)</b>
DC1: Sure	.824	.788
DC2: Firm	.766	.672

Factors	Factor Loading	
	Study 1	Study 2
DC3: Liking	.792	.711
DC4: Comfortable	.809	.687

**Table 4**  
Correlations, reliability, AVE, and mean

	Recency		Credibility		Heuristic		Speed		Confidence	
	Study1	Study2	Study1	Study2	Study 1	Study 2	Study 1	Study 2	Study 1	Study 2
Recency	<b>.509</b>	<b>.510</b>	.235	.087	.286	.032	.173	.075	.211	.070
Credibility	.485***	.296***	<b>.698</b>	<b>.582</b>	.204	.102	.186	.249	.317	.167
Heuristic	.452***	.181***	.445***	.320***	<b>.457</b>	<b>.489</b>	.270	.162	.221	.079
Perceived Speed	.416***	.273***	.431***	.499***	.456***	.403***	<b>.500</b>	<b>.525</b>	.232	.224
Confidence	.460***	.264***	.563***	.409***	.450***	.281***	.482***	.473***	<b>.637</b>	<b>.513</b>

\*\*\*=p<.001, \*\*=p<.01, \*=p<.05; The bold diagonal estimates are the AVE.

**Table 5**  
Summary of structural model

Hypothesis	Impact	Path Coefficient		Standard Error		t-value		Results	
		Study1	Study2	Study1	Study2	Study1	Study2	Study1	Study2
H1	Recency → Credibility	.828	.719	.075	.216	11.005***	6.461***	Supported	Supported
H2	Credibility → Heuristic	.919	.698	.100	.060	9.177***	6.3009***	Supported	Supported
H3	Credibility → Confidence	.453	.216	.065	.072	6.975***	2.289*	Supported	Supported
H4	Heuristic → Confidence	.546	.704	.081	.189	6.357***	5.259***	Supported	Supported
H5a	Heuristic → Perceived Decision Speed	.949	.956	.101	.218	9.742***	6.692***	Supported	Supported
H5b	Heuristic → Real Decision Time	-	-	-	-	-	-	Not supported	Not supported

Notes: The figures in italic refer to the results from Study Two. \*\*\*=p<.001, \*\*=p<.01, \*=p<.05

**Table 6**

Mediation test result

Hypothesis		Direct effect (X-Y)	Indirect effect	Result
Perceived credibility → Heuristic → Decision confidence	Study 1	.490(*)	.333(**)	Partial Mediation
	Study 2	.200(ns)	.496(**)	Full Mediation

\* =  $p < .05$ ; \*\* =  $p < .01$ ; ns= 'not significant'

**Table 7**

ANOVA test results

			Heuristic approach	Perceived decision speed	Decision confidence
F-value			2.944*	7.635***	4.425**
Sum of squares			8.472	20.383	12.405
Mean square			2.118	5.096	3.131
Age	<20	25	5.240 (.779)	5.020(.875)	5.320(.818)
	20-29	224	5.249(.885)	5.342(.867)	5.533(.785)
	30-39	315	5.480(.809)	5.662(.762)	5.732(.721)
	40-49	77	5.273(.868)	5.425(.845)	5.986(.838)
	50-59	13	5.487(1.12)	5.673(.943)	5.635(.776)
F-value			1.495	1.957	10.591***
Sum of squares			3.257	4.060	21.777
Mean square			1.086	1.353	7.259
Social media experience	<1	9	4.963(1.183)	5.166(1.038)	4.417(1.414)
	1-2	45	5.282(1.058)	5.333(1.076)	5.417(1.085)
	3-5	234	5.320(.851)	5.453(.817)	5.691(.809)
	>5	366	5.418(.815)	5.559(.800)	5.797(.785)
F-value			7.688***	13.801***	18.435***
Sum of squares			31.634	51.461	68.223
Mean square			5.272	8.577	11.371
Site familiar	Extremely unfamiliar	5	5.267(1.187)	5.100(1.353)	4.100(1.842)
	Very unfamiliar	13	5.435(.885)	5.634(.922)	5.596(.753)
	Unfamiliar	28	4.774(1.022)	4.714(1.113)	5.107(1.248)
	Neutral	107	5.041(.8122)	5.081(.816)	5.292(.873)
	Familiar	222	5.360(.833)	5.518(.776)	5.667(.784)
	Very familiar	189	5.537(.759)	5.731(.723)	5.965(.624)
	Extremely familiar	90	5.596(.853)	5.717(.740)	6.097(.722)

\*\*\*=p<.001; \*\*=p<.01; \*=p<.05; <sup>a</sup>Scale: 7-point Likert Scale; <sup>b</sup>Standard Deviations appear in parentheses after means.

**Table 8**

Post hoc

Dependent Variable	(I)Age	(J)Age	Mean difference	Std. Error	Sig.	
Heuristic approach	30-39	20-29	-.232	.074	*	
Perceived decision speed	30-39	<19	-.642	.169	**	
		20-29	-.319	.071	***	
Decision confidence	30-39	<19	-.527	.174	*	
		20-29	-.249	.073	**	
Decision confidence	(I)Social media experience	(J)Social media experience				
		<1	1-2	-1.000	.302	**
			3-5	-1.274	.281	***
			>5	-1.380	.279	***
		1-2	>5	-.380	.130	*
Heuristic approach	(I)Site familiar	(II)Site familiar				
		Unfamiliar	Familiar	-.586	.166	**
			Very familiar	-.764	.167	***
			Extremely familiar	-.822	.179	***

	Neutral	Familiar	-.319	.097	*
		Very familiar	-.497	.100	***
		Extremely familiar	-.555	.118	***
Perceived decision speed	Very familiar	Unfamiliar	.920	.264	*
	Unfamiliar	Familiar	-.803	.158	***
		Very familiar	-1.017	.159	***
		Extremely familiar	-1.002	.170	***
	Neutral	Familiar	-.436	.092	***
		Very familiar	-.649	.095	***
		Extremely familiar	-.634	.112	***
Decision confidence	Extremely unfamiliar	Very unfamiliar	-1.496	.413	**
		Neutral	-1.192	.359	*
		Familiar	-1.567	.355	***
		Very familiar	-1.865	.355	***
		Extremely familiar	-1.997	.360	***
	Unfamiliar	Familiar	-.560	.157	**
		Very familiar	-.858	.159	***
		Extremely familiar	-.990	.169	***
	Neutral	Familiar	-.375	.092	**
		Very familiar	-.673	.095	***

	Extremely familiar	-.805	.112	***
Familiar	Very familiar	-.297	.077	**
	Extremely familiar	-.429	.098	***

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