

What makes hotel online reviews credible? An investigation of the roles of reviewer expertise, review rating consistency, and review valence

Abstract

Purpose – This study adopts a cognitive heuristic approach to investigate the interaction effect of a message source characteristic (reviewer expertise) and two message structure characteristics (review rating consistency and review valence) on the perceived credibility of hotel online reviews.

Design/methodology/approach – Data were collected from 242 university students and were analyzed by three-way analysis of variance through a $2 \times 2 \times 2$ factorial experiment using a simulated hotel review page on TripAdvisor.

Findings – Results show a three-way interaction effect of reviewer expertise, review rating consistency, and review valence on the perceived credibility of hotel online reviews. The main effects of the three factors are also determined. Higher perceived credibility scores are found for negative reviews, reviews written by experts, and reviews with consistent rating.

Research limitations/implications – This study adopts an experimental approach and is the first to investigate the three-way interactions of message source and message structure characteristics of online hotel reviews. Data are collected from students in a university in Hong Kong. Results may not be generalizable to other markets.

Practical implications - Results suggest that reviews written by experts have higher perceived credibility. Hotels should pay attention to the content of online reviews and the expertise level of reviewers. Efforts should be exerted to create positive experiences for hotel guests that motivate expert reviewers to write positive reviews. Note that negative reviews have higher perceived credibility than positive ones. Hotels should promptly address negative reviews and provide professional responses to reviewers. Platform operators of user-generated content (UGC) should create well-defined reviewer profiles that can serve as cues that communicate the different expertise of reviewers.

Originality/value – This study is the first to test the three-way interaction effect of reviewer expertise, review rating consistency, and review valence on the perceived credibility of hotel online reviews. Results provide recommendations to hotels and UGC operators and enable them to benefit from emerging UGC usage.

Keywords – heuristics, perceived credibility, review rating consistency, review valence, reviewer expertise, user-generated content

Paper type - Research paper

Introduction

Information becomes increasingly collaborative through social interaction because of the development of advanced technology and Web 2.0. Internet users shifted their roles from passive readers to active creators and sharers of information and content (Wright and Zdinak, 2008). Online content created by users instead of professionals are referred to as user-generated content (UGC). Online review is one of the popular UGCs that consumers use when making travel decisions (Sparks and Browning, 2011). Consumers read online reviews written by other travelers to generate ideas, streamline choices, reduce risk, and confirm booking decisions (Cantalops and Salvi, 2014; Gretzel *et al.*, 2007). They consider reviews posted by travelers as more credible and important than the information provided by commercial sources (Gretzel and Yoo, 2008; Kusumasondjaja *et al.*, 2012). Online reviews demonstrated their powerful influence on the booking intention of customers (Zhao *et al.*, 2015), hotel occupancy rate (Viglia *et al.*, 2016), room revenue (Blal and Sturman, 2014), and business performance (Kim and Park, 2017).

Consumers adopt strategies that require minimal time and mental effort, such as the use of heuristic cues to handle online information (Metzger, 2007). Metzger *et al.* (2010) theorized that cognitive heuristics can be used in the credibility evaluation of online information. Consumers turn to online reviews to make booking decisions because of the intangibility of hotel products. Exposure to numerous online hotel reviews with varied quality may cause consumers to rely on certain cues related to the message source (the reviewers) or message structure (characteristics of the message) to evaluate the credibility of review contents.

Prior research demonstrated the importance of investigating the perceived credibility of online reviews according to consumers. The perceived credibility of UGCs positively influences the information adoption of consumers (Ayeh *et al.*, 2013; Cheung *et al.*, 2009; Filieri and McLeay, 2014; Nhon and Khuong, 2015). The attributes of the message source (the sender of the message), which includes source credibility (Lee *et al.*, 2011), user profile, reviewer characteristic (Flanagin and Metzger, 2000), and message structure, which entails argument strength (Cheung *et al.*, 2008; Cheung *et al.*, 2009) and the positive and negative orientation of the message (Kusumasondjaja *et al.*, 2012), affect the credibility perception of electronic word-of-mouth (eWOM). Most previous studies only investigated the independent effect of reviewer characteristics, review consistency, and review valence on the perceived credibility of UGCs on online shopping websites. Few investigations focused on hotel reviews online (e.g., Ayeh *et al.*, 2013; Casalo *et al.*, 2015; Filieri and Mcleay, 2014; Kwok and Xie, 2016; Kusumasondjaja *et al.*, 2012; Lee *et al.*, 2011; Nhon and Khuong, 2015; Sparks and Browning, 2011; Xie *et al.*, 2011). Investigating the perceived credibility of hotel online reviews is not only beneficial to consumers but also to hotels and UGC-platform providers. Hotels can certainly gain from understanding the perceived service quality and customer satisfaction of reviewers to improve their service delivery and review ratings. UGC-platform providers are concerned about the quality and quantity of reviews generated as they affect the user volume of their websites.

This study aims to address an interesting but unanswered question: Do reviewer expertise (message source), review rating consistency, and review valence (message structure) interact in influencing the perceived credibility of hotel online reviews? The following research objectives are defined for this work:

- (1) Examine how the interaction effect of reviewer identity, review rating consistency, and review valence influence the perceived credibility of hotel online reviews;
- (2) Examine the effect of reviewer expertise on the perceived credibility of hotel online reviews;
- (3) Examine the effect of review rating consistency on the perceived credibility of hotel online reviews; and
- (4) Examine the effect of review valence on the perceived credibility of hotel online reviews.

Literature review

Perceived credibility of UGC

Perceived credibility is defined as “the extent to which a communicator is perceived to be a source of valid assertion” (Hovland *et al.*, 1953, p.21). According to Eisend (2006), credibility is the degree to which a receiver considers information to be believable. Credibility is a multidimensional concept for which different conceptualizations are provided by researchers. The structure of credibility hinges on the communication context (Cronkhite and Liska, 1976) and is shaped by the characteristics of the source, receiver, and message (Lim and Van Der Heide, 2015; Shan, 2016). Reichelt *et al.* (2014) defined eWOM credibility as expertise, trustworthiness, and perceived similarity. Perceived UGC credibility is similar to eWOM credibility in the sense that information receivers consider reviews and recommendations as valid, believable, factual, accurate, credible, and trustworthy (Cheung *et al.*, 2008; Flanagin and Metzger, 2000; Fogg *et al.*, 2003; Tseng and Fogg, 1999; Xu, 2014). For studies of online UGCs, Xie *et al.* (2011) operationalized the perceived credibility of hotel online reviews as the level of trustworthiness and reflection of reality. Kusumasondjaja *et al.* (2012) used the criteria of accuracy, believability, unbiasedness, completeness, and trustworthiness. Ayeh *et al.* (2013) employed expertise and trustworthiness. Lim and Van Der Heide (2015) considered competence, caring and goodwill, and trustworthiness as the dimensions of perceived credibility of restaurant reviews.

Credibility evaluation: A heuristic approach

When individuals are faced with complex and uncertain situations and are exposed to information that varies in quality and quantity, they tend to use simple heuristics and cues in the decision-making process (Sundar, 2008). Cue is “a piece of information provided by a medium that allows for evaluation of that information, possibly by triggering heuristics” (Sundar *et al.*, 2008, pp. 3455). Cues in web-based content prompt heuristics that assist credibility evaluation (Sundar, 2008).

Cognitive heuristics are information processing strategies that are based on the use of “mental short cuts, rules-of-thumb, or guidelines that reduce cognitive load during

information processing and decision making” (Tversky and Kahneman, 1974 as cited in Flanagin and Metzger, 2008, p.144). Cognitive heuristics help people cope with vast quantities of information in their decision-making process (Goldstein and Gigerenzer, 1999). Online UGC is intended to aid consumers in making good choices. Consumers of UGC want to formulate decisions effectively and efficiently with optimal effort. Therefore, a heuristic approach fits the actual behavior of consumers that utilize UGC. Sundar (2008) proposed the application of the heuristic approach in the credibility evaluation of online content. This approach was adopted by other researchers, such as Metzger *et al.* (2010), Metzger and Flanagin (2013), and Sundar *et al.* (2008) in testing the usage of heuristics in credibility evaluations.

Heuristics can hardly be sorted into mutually exclusive subsets, but a combination of heuristic categories can be utilized in various decision-making situations (Metzger *et al.*, 2010). Metzger and Flanagin (2013) and Sundar *et al.*, (2008) identified the different heuristic types adopted by consumers in their studies on websites and online reviews. *Reputation heuristic* indicates that individuals tend to make decisions by following specialists and experts in the area (Fritch and Cromwell, 2002; Metzger *et al.*, 2010; Metzger and Flanagin, 2013). People are usually convinced by sources from information contributors with high public recognition and authorization (Sundar, 2008). *Endorsement heuristic* manifests itself when people are prone to automatically perceive sources of information as credible simply because they are endorsed by peers (Xu, 2014; Metzger *et al.*, 2010). *Bandwagon heuristic* is a typical subset of endorsement heuristic defined as the likelihood of individuals to assume something as credible if many others think so (Sundar, 2008). Such a heuristic is a powerful factor that influences credibility valuation (Metzger and Flanagin, 2013; Sundar, 2008). Sundar (2008) implied that users likely seek third-party endorsements or recommendations for credibility assessments. Hence, the perceived credibility of reviews depends on the reputation of reviewers and the endorsement of such reputation by others. Another commonly adopted strategy for assessing information credibility is *consistency heuristic*. Individuals validate information by checking its consistency across different sources. People assume that consistency indicates correctness (Chaiken, 1987). Tseng and Fogg (1999) also revealed that people are liable to judge credibility on the basis of surface credibility and consistency with others.

Factors that affect perceived credibility of UGC

Reviewer expertise

When consumers search information for decision making, they tend to seek experts’ views on specific products or services. Prior research emphasized that reviewer credibility and expertise influence the perceived credibility of reviews (Baek *et al.*, 2012; Cheung *et al.*, 2008; Cox *et al.*, 2009; Gretzel *et al.*, 2007; Kwok and Xie, 2016; Lee *et al.*, 2011; Metzger and Flanagin, 2013; Nhon and Khuong, 2015; O’Connor, 2008; Sparks and Browning, 2011; Xu, 2014; Zhang and Watts, 2008). Online information without sufficient authority indicators, such as author reputation and identity, are perceived as less credible than other information (Fritch and Cromwell, 2002). Nhon and Khuong (2015) asserted that source identity has significant direct effects on perceived credibility and indirectly

affects travel decision making. Similarly, Liu and Park (2015) revealed that disclosure of reviewer identity has a significant impact on the perceived usefulness of online restaurant reviews.

Reviewer expertise and reputation can be observed through different cues on the reviewer's profile. Examples include contributor level, the number of reviews completed (Cheung *et al.*, 2008; Cox *et al.*, 2009; Gretzel *et al.*, 2007; Lee *et al.*, 2011), number of helpful votes received (Zhang and Watts, 2008), and level badges gained (Baek *et al.*, 2012). Prior studies also suggested that reputation cue positively influences trust and information adoption in travel domains Xu, 2014). Kwok and Xie (2016) indicated that reviewer experience, as represented by reviewer status, years of membership, and number of cities visited, is critical in affecting the perceived helpfulness of reviews. The number of reviews written is the most important factor in individual evaluation of credibility of online reviews (O'Connor, 2008). Hence, Hypothesis 1 is proposed.

H1: The perceived credibility of hotel online reviews is higher for reviews written by reviewers with higher level of expertise than for those written by amateurs.

Review rating consistency

Consistency heuristic explains that review rating consistency can predict perceived credibility. Review consistency refers to the extent to which message content is consistent with or similar to others regarding the same product or service (Barry and Schamber, 1998; Cheung *et al.*, 2012; Zhang and Watts, 2003). Cheung *et al.* (2009) measured consistency through the degree of consensus and similarity with other reviews of the same product. Consensus with the aggregated rating on UGC websites also indicates consistency of review rating (Qiu *et al.*, 2012).

Information in high consensus with those provided by other reviewers is perceived as credible. People likely believe information when the content is consistent across different sites and sources (Metzger *et al.*, 2010). Studies found that review consistency positively affects the perceived credibility of eWOM (Cheung *et al.*, 2009; Cheung *et al.*, 2012; Qiu *et al.*, 2012; Sundar, 2008; Zhang and Watts, 2008). Review content in consensus with others create little cognitive dissonance (Cheung *et al.*, 2012). Qiu *et al.* (2012) revealed that inconsistent rating and review content decrease the perceived credibility of eWOM. The positive influence of review consistency on the perceived credibility of consumer products' reviews was examined (e.g., Cheung *et al.*, 2009; Sundar, 2008), but the present study explores online reviews of an experiential product, namely, a hotel. This study specifically investigates consistency in the overall ratings of reviews. Thus, Hypothesis 2 is proposed.

H2: The perceived credibility of hotel online reviews is higher for reviews with overall ratings that are consistent with others than for those that are inconsistent.

Review valence

Frijda (1986) defined valence as the positive and negative orientation of information. Customers are exposed to positive and negative reviews on UGC platforms. Researchers hold different views on the effect of positive and negative reviews on consumer behavior. Moreover, people's intention to book and trust hotels are higher when they are exposed to positive reviews than negative reviews (Sparks and Browning, 2011). are not significantly affected by positive reviews and may believe that writing positive reviews is encouraged by social norms and self-esteem (Feldman, 1966; Fischer *et al.*, 2005; Mizerski, 1982; Smith *et al.*, 1999).

By contrast, information seekers perceive negative feedback as customer dissatisfaction (Folkes *et al.*, 1987). In comparing positive information or product reviews, some researchers found that negative information or product reviews have considerable effect on consumer responses because they can find information about specific problems other consumers may encounter when using the products (Mizerski, 1982; Pavlou and Dimoka, 2006). Customers tend to pay more attention to negative than positive reviews (Smith *et al.*, 1999). Scholars argued that people regard negative reviews as more credible and they respond more saliently to them than to positive ones (Fiske, 1993; Kusumasondjaja *et al.*, 2012; Lee and Koo, 2012; Papathanassis and Knolle, 2011; Sen and Lerman, 2007; Smith *et al.*, 1999). Park and Lee (2009) compared the effect difference of negative eWOM on experience goods (products or services with characteristics that are difficult to observe prior to purchase) and search goods (products or services with features that are easily evaluated before consumption). Their study revealed that the effect of negative reviews is more salient for experience goods than for search goods. As hotels are experience goods that cannot be imagined and evaluated before consumption, people may react saliently to negative hotel reviews. Therefore, Hypothesis 3 is proposed.

H3: The perceived credibility of hotel online reviews is higher for reviews that are negatively framed than for those that are positively framed.

Consumers are exposed to different types of cues that indicate the message source and message structure characteristics. Cheung *et al.* (2012) studied the interaction effects of message characteristics (argument quality, source credibility, review consistency, and review sidedness) and the readers' characteristics (level of expertise and involvement) on the credibility of online reviews of electronic products. Only review sidedness and level of reader involvement found to have interactional effects on the perceived credibility of the reviews. In examining the interaction effect of reviewer identity and review valence on the perceived credibility of hotel online reviews, Kusumasondjaja *et al.* (2012) asserted that negative reviews are perceived as more credible than positive reviews when reviewer identity is disclosed. Liu and Park (2015) found that the number of reviews and voted reviews written by the reviewer are negatively correlated with the star ratings of restaurants; this finding implies that reviewer expertise and review valence are negatively related to the prediction of the perceived usefulness of reviews. Consumers tend to use more credible sources of information when they have little or no prior knowledge of the quality of a product they intend to purchase (Jain and Posavac, 2001). Moreover, when a consumer is reading a review written by a reviewer with a high expertise level, the perceived credibility of the review should be higher than those written by amateurs. Thus, when the review is

written by expert reviewers and the review is consistent with other earlier reviews in terms of content, the perceived credibility of the review would be high. The orientation of the review (positively or negatively framed) also independently moderates the effect of reviewer profiles (Xu, 2014) and review consistency (Doh and Hwang, 2009) on perceived credibility. Hence, review valence may moderate the effect of reviewer expertise and recommendation consistency on the perceived credibility of hotel online reviews. Therefore, we put forward the following hypothesis:

H4: A three-way interaction effect of reviewer expertise, review rating consistency, and review valence exist on the perceived credibility of hotel online reviews.

Methodology

Research design

An experimental design was chosen to test the hypotheses. Experimentation is appropriate as it allows for the manipulation of one or more independent variables and measurement of their effects on dependent variables (Ladhari and Michaud, 2015). A 2 (reviewer expertise [RE]: expert and amateur) x 2 (review rating consistency [RC]: consistent and inconsistent) x 2 (review valence [RV]: positive and negative) between-participants experiment was conducted to explore the interaction effect.

Hotel reviews on the TripAdvisor website were chosen as the subject of this study as they are considered experiential travel products with unique intangible characteristics. TripAdvisor, the largest global travel site, offers over 500 million reviews and opinions on different travel products from travelers all over the world since it was launched in 2000 (TripAdvisor, 2017). Eight virtual review scenarios were constructed by adapting the generic layout of the hotel review page on TripAdvisor, which includes a fictitious hotel name, a photo (of an obscure hotel in Tokyo), and an aggregated hotel ranking adopted from the experiment by Salehi-Esfahani *et al.* (2016). A fictitious name was created for the hotel to reduce bias as participants may have prior knowledge, attitude, preference, or experience (Kusumasondjaja *et al.*, 2012). Review contents were adapted from actual TripAdvisor reviews, and modifications were made to reflect the different levels of review overall rating consistency and valence. Each simulated webpage contained three different reviews of the same hotel and information about the reviewers' expertise. The name and home country of reviewers and posted time of reviews were deleted to eliminate geographic (Forman *et al.*, 2008), timeliness, and temporal contiguity (Wu *et al.*, 2017). Similar to Cheung *et al.* (2009) and Cheung *et al.* (2012), the present study only employed the reputation cues and expertise levels of reviewers to operationalize RE. RE was represented by the expertise level of reviewers based on contributor levels, number of reviews written, and reader votes for helpfulness. RC was denoted by the hotel overall rating that is consistent or inconsistent with the other reviews in the scenario. RV was indicated by the positive and negative orientation of reviews. Positive hotel reviews described pleasant experiences and recommended hotels to people, whereas negative ones expressed unpleasant experiences and encouraged people to avoid certain hotels (Xu, 2014). Only the first review of each scenario was tested. Figure 1 illustrates the manipulated variables on

the simulated hotel review webpages.

[PLEASE INSERT FIGURE 1 HERE]

Manipulation check

To manipulate RE level, “expert” reviewer profiles were set with a high contributor level (5–6), additional reviews (100), and reviews voted as helpful (30). “Amateur” review profiles were constructed with a low contributor level (1), few reviews (10), and 0 reviews voted as helpful. A manipulation check was conducted through a yes–no question about expertise level (chi-square result: $\chi^2 = 33.94$, $N = 242$, $p = 0.000^{***}$). RC was tested using a yes–no question about whether the first review was consistent with other reviews (chi-square result: $\chi^2 = 33.94$, $N = 242$, $p = 0.000^{***}$). RV was measured on a five-point scale, where 5 = very positive, 4 = positive, 3 = neutral, 2 = negative, and 1 = very negative (Zou *et al.*, 2011). T-test showed that respondents who read reviews with a five-star rating acknowledged a positive overall attitude of reviewers (positive: Mean = 4.47, Standard Deviation (SD) = 0.657), whereas respondents who read reviews with a one-star rating acknowledged a negative overall attitude (negative: Mean = 1.82, SD = 0.777, t-value = 28.578, $p = 0.000^{***}$).

Measure development

Perceived credibility (PC) was measured with three items adopted from Cheung *et al.* (2012) and Xu (2014). They include “I think the review is believable,” “I think the review is factual,” and “I think the review is accurate” (Cronbach’s $\alpha = .74$). A seven-point Likert scale was adopted, where 7 = strongly agree, 6 = agree, 5 = moderately agree, 4 = neutral, 3 = moderately disagree, 2 = disagree, and 1 = strongly disagree. Demographic information and information about the UGC-usage behavior of respondents were collected, including frequency of online searching and traveling, experience with any UGC platform, and number of reviews read. A pilot test was conducted to assess whether the research protocol was feasible and if the measures of the study variables were effective. Ten students from various disciplines from a university in Hong Kong were invited to join the pilot test on a voluntary basis. To ensure face validity, respondents were asked whether they thought the statements measured the corresponding variables after finishing the survey. Feedback regarding the selection of hotels and virtual webpage designs were recorded. Modifications were made to improve scenarios and the questionnaire design.

Sampling and data collection

Hong Kong residents have the second highest propensity to travel in Asia Pacific (Mastercard, 2017); students from a local university constitute the population of the current study. The selected university has around 28,500 students. About 97% of the students were of Chinese nationality (Hong Kong, Macau, Mainland China, and Taiwan) and the rest were from other countries. Cao and Mokhtarian (2005) indicated that the demographical profiles of college students (aged 18–25) were similar to those of online consumers who utilize online reviews when making hotel booking decisions. Prior studies on perceived

Internet information credibility, such as Flanagin and Metzger (2000), also adopted a sample of university students because their profiles were comparable to typical contemporary Internet users in the U.S. A self-administrated online questionnaire was created and distributed for one week in March 2017. Invitations to participate in the study were distributed through WeChat and Facebook. Participants were selected using convenience and snowball sampling. Sample size was set to 240 according to the rule of thumb of at least 30 cases for each tested scenario (Wu *et al.*, 2015). Respondents who neither had travel experience during the past two years nor used any online UGC information to plan their travel were excluded from the study. Those who traveled during the past two years regardless of whether they used TripAdvisor or not in the past 12 months were included in the sample for data analysis because we wanted to assess the perceptions of users and non-users on different scenarios.

Data analysis

The collected data were analyzed using the Statistical Package for the Social Sciences software. A two-step approach was applied for data analysis as proposed by Anderson and Gerbing (1988). The first step aimed to ensure content validity and reliability. To ensure content validity, the measurement items were adopted from prior studies. Cronbach's alpha was computed from the data to ensure guarantee internal consistency and reliability. The second-step sought to address the research objectives and test the hypotheses. A three-way analysis of variance was applied to explore the main and interaction effects of RE, RC, and RV on PC.

Findings

Respondents' profile

Out of the 263 completed questionnaires, 242 were valid. Approximately 66.5% of the respondents were female, and 33.5% were male. These findings were consistent with other online surveys, which suggests that females are more willing to participate in surveys than males (Sax *et al.*, 2008). Most respondents were from young generations of Chinese bachelor degree students. Approximately 66.4% of the respondents traveled more than three times in the past two years. Only 37.8% used TripAdvisor for trip planning. Among the respondents who used TripAdvisor, approximately 75.8% checked hotel rankings and reviews, and the majority read between 3–5 reviews (41.76%). Table 1 presents the detailed profiles of respondents.

[PLEASE INSERT TABLE 1 HERE]

Testing of main and interaction effects

As shown in Table 2, a statistically significant three-way interaction exists between RE, RC, and RV, $F(1, 234) = 13.834$, $p = 0.000$ and partial $\eta^2 = 0.056$. Two-way interactions were observed between RE and RC, $F(1, 234) = 4.543$, $p = 0.034$ and partial $\eta^2 = 0.019$; RE and RV, $F(1, 234) = 5.918$, $p = 0.016$ and partial $\eta^2 = .025$; and RC and RV, $F(1, 234) = 10.813$, $p = 0.001$ and partial $\eta^2 = 0.004$. The main effects of RE, $F(1, 234) =$

241.958, $p = 0.000$ and partial $\eta^2 = 0.508$; RC, $F(1, 234) = 247.883$, $p = 0.000$ and partial $\eta^2 = 0.514$; and RV $F(1, 234) = 92.910$, $p = 0.000$ and partial $\eta^2 = .284$ were also observed. The guidelines suggested by Cohen (1988) state that effect sizes (partial η^2) of 0.2, 0.5, and 0.8 indicate small, medium, and large effects, respectively.

[PLEASE INSERT TABLE 2 HERE]

Given that a significant three-way interaction was observed, the simple two-way interactions between RE and RC at different RV levels (positive and negative) on the PC of hotel online reviews were tested. A statistically significant simple two-way interaction existed between RE and RC when the reviews were positive, $F(1, 234) = 17.407$, $p = 0.000$, but not when the reviews were negative, $F(1, 234) = 1.240$, $p = 0.267$. Figure 2 shows the results of the simple two-way interaction between RE and RC for positive and negative reviews. RC moderated the effect of RE when RV was positively framed.

[PLEASE INSERT FIGURE 2 HERE]

A statistically significant simple two-way interaction exists between RC and RV when the RE was amateur, $F(1, 234) = 24.008$, $p = 0.000$, but not when the RE was expert, $F(1, 234) = 0.095$, $p = 0.758$. The effect of RC on RV depended on whether RE was amateur. Figure 3 shows the results of the simple two-way interaction between RC and RV for reviews written by experts and amateurs. RV moderated the effect of RC when RE was amateur.

[PLEASE INSERT FIGURE 3 HERE]

Finally, a statistically significant simple two-way interaction exists between RE and RV when RC was inconsistent, $F(1, 234) = 19.268$, $p = 0.000$, but not when it was consistent, $F(1, 234) = 0.813$, $p = 0.368$. The effect of RE on RV depends on the inconsistency of RC. Figure 4 shows the results of the simple two-way interaction between RE and RV for reviews with content that were consistent and inconsistent with others. RE moderated the effect of RV when RC was inconsistent.

[PLEASE INSERT FIGURE 4 HERE]

Tests on simple simple main effects were conducted because statistically significant simple two-way interactions were found. Statistically significant simple simple main effects of RC were found for negative RV and amateur RE, $F(1, 234) = 27.891$, $p = 0.000$; negative RV and expert RE, $F(1, 234) = 50.589$, $p = 0.000$; positive RV and amateur RE, $F(1, 234) = 156.865$, $p = 0.000$; and positive RV and expert RE, $F(1, 243) = 44.334$, $p = 0.000$. Statistically significant simple simple main effects of RV were obtained for amateur RE and inconsistent RC, $F(1, 234) = 90.735$, $p = 0.000$; amateur RE and consistent RC, $F(1, 234) = 6.149$, $p = 0.014$; expert RE and inconsistent RC, $F(1, 234) = 11.938$, $p = 0.000$; and expert RE and consistent RC, $F(1, 243) = 14.682$, $p = 0.000$. Finally, statistically significant simple simple main effects of RE were confirmed for inconsistent RC and negative RV, $F(1, 234) = 32.599$, $p = 0.000$; inconsistent RC and positive RV, $F(1, 234) =$

150.499, $p = 0.000$; consistent RC and negative RV, $F(1, 234) = 53.397$, $p = 0.000$; and consistent RC and positive RV, $F(1, 243) = 36.010$, $p = 0.000$.

More than one statistically significant simple main effect was found. This finding means that an overall effect of an independent variable on the dependent variable was present for a particular subset of data. This outcome was ascertained by running multiple simple pairwise comparisons with a Bonferroni adjustment. All pairwise comparisons indicated significant mean differences in PC scores. The mean scores of PC for positive and negative RV were significantly different at various levels of RC and RE. In particular, the mean scores of PC for expert and amateur RE significantly varied at dissimilar levels of RC and RV. Finally, the mean scores of PC for consistent and inconsistent RC significantly differed at different levels of RE and RV. Table 6 summarizes the results of the comparisons.

Results of hypotheses testing

The main effect of RE was statistically significant across all pairwise comparisons. Table 3 shows a mean score difference across level indicators for “expert” (Mean = 4.73, SD = 0.51) and “amateur” reviewers (Mean = 4.02, SD = 0.62). The effect size for RE was 0.508, which indicates that the difference between groups had medium practical significance. Reviews by experts had significantly higher perceived credibility than those by amateurs. Hence, H1 was supported. The main effect of RC was statistically significant across all pairwise comparisons. A mean score difference across level indicators for “consistent” (Mean = 4.76, SD = 0.51) and “inconsistent” (Mean = 4.03, SD = 0.62) was observed. The effect size for RC was 0.514, which suggests that the difference between groups had medium practical significance. Reviews with consistent ratings had significantly higher perceived credibility than inconsistent ones. Thus, H2 was supported. The main effect of RV was statistically significant across all pairwise comparisons. A mean score difference across level indicators for “negative” (Mean = 4.62, SD = 0.55) and “positive” reviews (Mean = 4.16, SD = .71) was observed. The effect size for review valence was 0.284, which denotes that the difference between groups had small to medium practical significance. Negative reviews had significantly higher perceived credibility than positive reviews. Therefore, H3 was supported. Finally, a statistically significant three-way interaction existed between, RE, RC, and RV, $F(1, 234) = 13.834$, $p = 0.000$ and partial $\eta^2 = 0.056$. Accordingly, H4 was supported. Results of the hypotheses testing are summarized in Table 5.

[PLEASE INSERT TABLE 6 HERE]

Conclusion and discussion

Conclusion

This study examined the interaction and main effects of the characteristics of the message source (reviewer’s expertise level) and the message structure (review rating consistency and the review valence of the review) on the perceived credibility of hotel online reviews. Results suggest that hotel online reviews written by experts and that are

consistent in rating have significantly higher perceived credibility than those written by amateurs and are inconsistent. This outcome is consistent with the explanation of Metzger *et al.* (2010) about reputation and endorsement. Reviewer profiles with inadequate authority indicators are perceived as less credible (Fritch and Cromwell, 2002). Findings are also consistent with prior studies which suggest that the reviewer's credibility or expertise level influences the perceived credibility of reviews and other UGCs (e.g., Baek *et al.*, 2012; Cheung *et al.*, 2008; Cox *et al.*, 2009; Gretzel *et al.*, 2007; Kwok and Xie, 2016; Lee *et al.*, 2011; Metzger and Flanagin, 2013; Nhon and Khuong, 2015; O'Connor, 2008; Sparks and Browning, 2011; Xu, 2014; Zhang and Watts, 2008). In accordance with previous research (Cheung *et al.*, 2012; Qiu *et al.*, 2012; Sundar, 2008; Zhang and Watts, 2008), the results of the present study show that reviews with consistent ratings have a significantly higher perceived credibility than those with inconsistent ratings. According to heuristic theory, people are likely to assume that consistency indicates correctness (Chaiken, 1987) and they tend to judge credibility using consistency heuristics (Metzger *et al.*, 2010). As mentioned in the literature review, no consensus exists among researchers on whether the positive or negative reviews in UGC will contribute to higher perceived credibility. Findings of the current study support extant research that found negative reviews to be more credible than positive ones (Fiske, 1993; Kusumasondjaja *et al.*, 2012; Lee and Koo, 2012; Papathanassis and Knolle, 2011; Sen and Lerman, 2007; Smith *et al.*, 1999). People are likely to think that positive reviews are encouraged by social norms (Feldman, 1966; Mizerski, 1982), and such reviews are perceived to be less credible than their negative counterparts.

Previous studies investigated the two-way interaction effect of the message sender's characteristics and the message structure on the cognitive and affective consequences (Xu, 2014) and on the eWOM effect (Park and Lee, 2009). In the present study, 1) the interaction effect of reviewer expertise and review rating consistency on perceived credibility is found only in positive reviews, 2) the interaction effect of reviewer expertise and review valence on perceived credibility is found only in inconsistent reviews, and 3) the interaction effect of review rating consistency and review valence on perceived credibility is found only in reviews written by amateurs. Given the nature of online reviews, consumers are exposed to different online cues at the same time. Therefore, their evaluation of review credibility may be influenced by more than one cue. This work confirmed a three-way interaction effect of reviewer expertise, review rating consistency, and review valence on the perceived credibility of hotel online reviews. This outcome suggests that the interaction effect of two factors is moderated by a third one.

Theoretical contributions

This study adopts a cognitive heuristic approach to investigate the interaction effects of reviewer expertise, review rating consistency, and review valence on the perceived credibility of hotel online reviews. Current results contribute to the literature on cues that influence the perceived credibility of online UGCs for intangible experiential products, such as hotels. The present study verifies the impact of cues that communicate the characteristics of the message source and the message structure on perceived credibility.

This study is one of the first attempts to test the three-way interactions of reviewer expertise, review rating consistency, and review valence on the perceived credibility of hotel online reviews. Prior studies on online reviews focused on the interaction effect of two independent variables on a dependent variable, namely, credibility and trust (e.g. Kusumasandjaja *et al.*, 2012); these studies were conducted for online consumer product review websites (Qiu *et al.*, 2012). Furthermore, previous investigations were inconclusive as regards the effect of positively and negatively framed reviews. The current study supports extant literature that indicated that negative reviews are perceived as more credible than positive reviews (Kusumasondjaja *et al.*, 2012; Papathanassis and Knolle, 2011; Sen and Lerman, 2007).

Practical implication

The findings have implications for hotels, UGC platforms (such as TripAdvisor), and individuals writing online reviews. Regardless of the nature of the reviews (positive or negative), they serve as valuable information sources for hotel managers in helping them understand the type of experiences travelers like and dislike (Casalo *et al.*, 2015). Hotel managers or social media managers should recognize that hotel reputations are easily ruined by negative reviews (Vermeulen and Seegers, 2009), but they must also accept that negative reviews are unavoidable. Companies or products with only positive reviews will lead consumers to assume that their review content is fake or that the negative content is being moderated or removed. Results of this study indicate that negatively framed reviews are perceived as highly credible. Hotels must pay close attention to negative reviews (Vermeulen and Seegers, 2009) and respond promptly by providing timely and sincere service recoveries. Thus, hotels should create standard procedures and protocols in responding to positive and negative reviews to ensure that responses are personally tailored to address review contents. Furthermore, the hotels' written responses to negative reviews are viewed by other readers, thereby increasing their awareness of the efforts made by hotels in handling negative comments. If dissatisfied guests are satisfied with how hotels handle negative comments, they may be motivated to write positive reviews about their genuine service recoveries. To guarantee that the reviews reflect the truth and are based on real customer experience, hotels should trace review sources and certify their reliability. For example, hotels are advised to update reviews retrieved from UGC platforms in the corresponding customer profiles in their property management system to alert associates when future bookings are made. Hotels and UGC platform operators should collaborate to deal with fraudulent reviews as they can damage their reputations.

Reviews from expert reviewers are perceived as more credible than positive ones. Thus, hotels must give the highest priority in handling these reviews by delivering services which exceed the expectations of customers. Hotels should not only pay attention to guests who are "influential reviewers." They must be prepared to deliver the best possible stay experience for all guests. Nevertheless, by being highly alert to influential reviewers and by delivering exceptional customer experience, hotels will have a higher possibility of generating positive reviews. Taking great care of guests during their entire stay can help minimize the occurrence of negative reviews. Moreover, guests tend to write positive reviews when they receive high-quality and flawless service. The reputation of hotels is

enhanced when positive reviews are posted on UGC platforms. Furthermore, given that consistent review ratings have high perceived credibility, hotels should emphasize the delivery of constantly superior services to increase their chance of receiving consistently high ratings.

Well-defined reviewer profiles provide integrated information about writers. To help consumers recognize the expert level of reviewers, TripAdvisor and other UGC platform providers can provide additional “cues,” such as their area of expertise or specialty on their profiles. Given that users find reviews from specialized expert reviewers credible, they tend to use UGC platforms frequently. Racherla and Friske (2012) suggested that reviews with highly perceived credibility can contribute to raising user volume. UGC platform providers can encourage and guide reviewers to write credible reviews by offering online videos and motivate them to generate additional appraisals.

Limitation and future research

This study provided useful insights on the interaction effects of reviewer expertise, review rating consistency, and review valence on the perceived credibility of hotel online reviews, but methodological limitations exist. Caution must be taken when interpreting results. This study only investigated the main and interaction effects of factors related to the message source (reviewer expertise) and message structure (review rating consistency and review valence) on the perceived credibility of the reviews. Other factors related to the reviewers, reviews, and the review readers have not been explored. Further study may include other relevant determinants as covariates, such as gender, age, and usage experience. In addition, the responses of hotels to reviews may affect the review valence, which can be considered for upcoming studies. The eight different scenarios created for the experiments were based on one fictitious hotel in Tokyo. Thus, the content might be destination-specific and the familiarity and attitude of respondents toward the destination might create possible biases. Future studies may consider using other destinations and accommodations of different service levels. Moreover, data were collected from university students. Thus, the results might not be generalizable to other consumer groups. Although the respondents have all used UGC in their travel planning, the results may be biased given that only more than a third of the respondents used TripAdvisor. Future studies can be conducted with other customer groups, such as meeting industry professionals (Boo and Busser, 2018) and customers of different ethnicity (Fan et al., 2018) to validate the findings of this current study. Additionally, this study adopted an experimental approach which confines the study to a limited number of variables. Future studies may adopt other methods for testing other variables and their relationships. Finally, the current study used only TripAdvisor, which is a community-based platform, as the study context. Further study may consider using other transaction-based platforms, such as online OTAs with review platforms, to validate the results of the current study.

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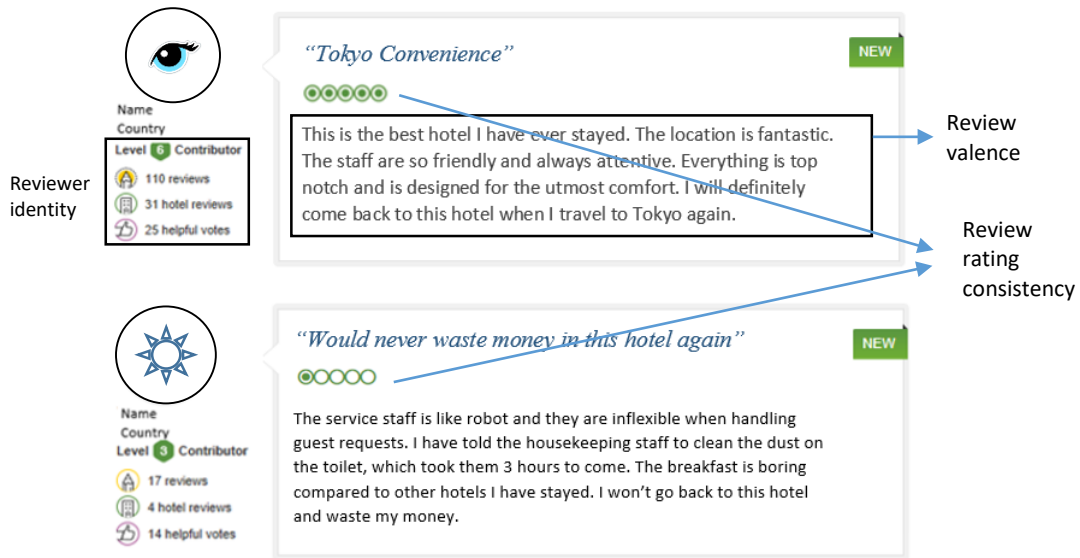


Figure 1. Illustrations of the variables on the simulated hotel reviews webpage

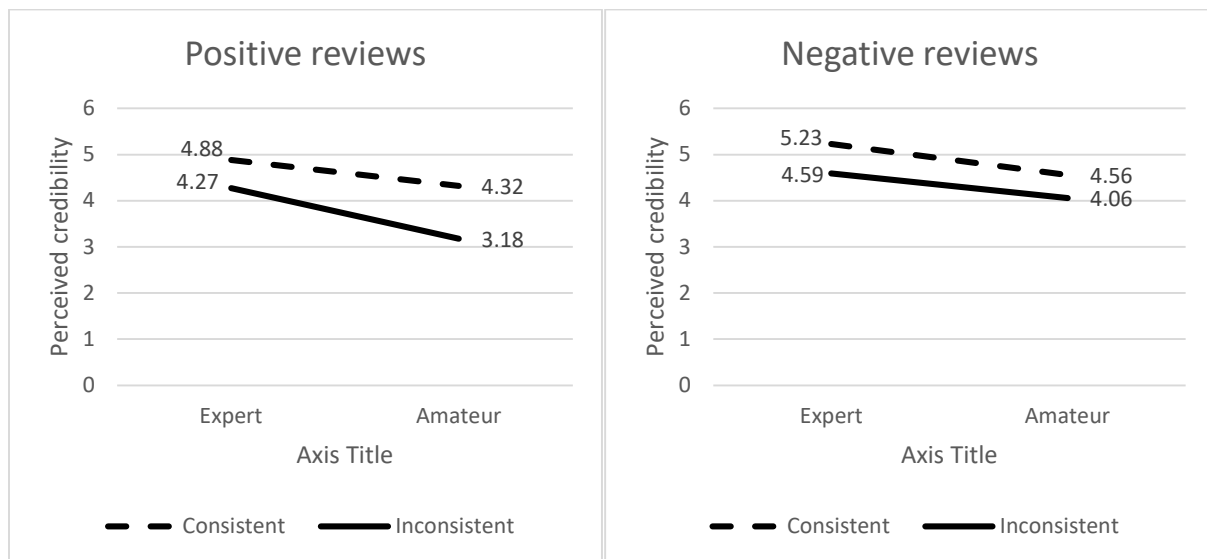


Figure 2. Simple two-way interaction of reviewer expertise and review rating consistency on perceived credibility of hotel online review for positive and negative reviews.

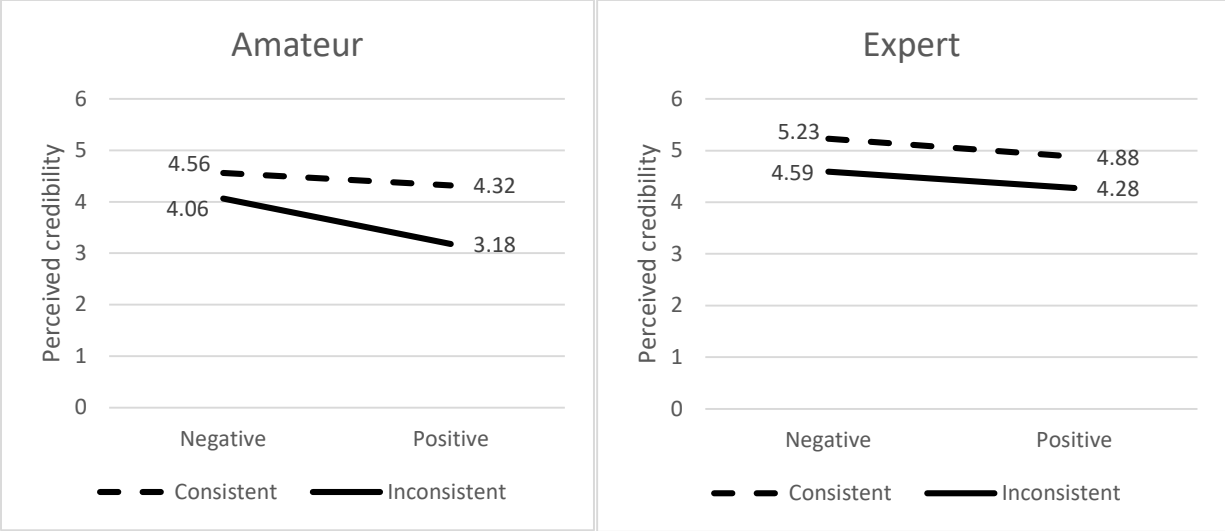


Figure 3. Simple two-way interaction of review rating consistency and review valence on perceived credibility of hotel online review for reviews written for amateurs and experts.

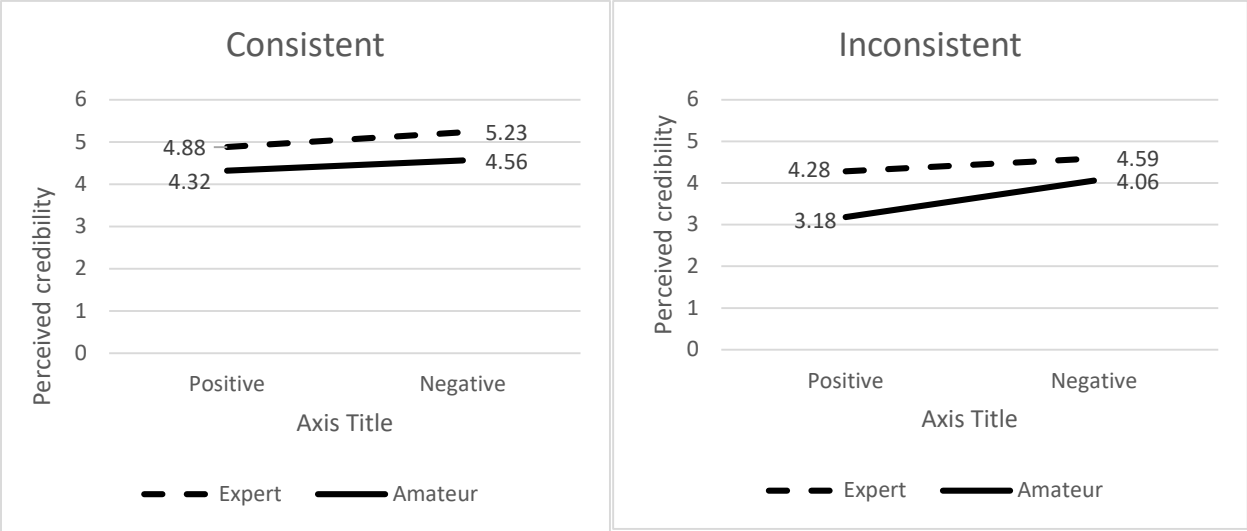


Figure 4. Simple two-way interaction of reviewer expertise and review valence on perceived credibility of hotel online review for consistent and inconsistent reviews.

Table 1. *Respondents' Profile*

	Frequency	Percentage
<u>Gender(N=242)</u>		
Female	161	66.53%
Male	81	33.47%
<u>Age (N=242)</u>		
20 or below	89	36.78%
21-25	145	59.92%
26-30	3	1.24%
31 or above	5	2.07%
<u>Current educational level (N=242)</u>		
High diploma/Associate degree	13	5.37%
Bachelor degree	205	84.71%
Master degree or above	24	9.92%
<u>Ethnicity (N=242)</u>		
Chinese (Mainland, HK and Macau, and Taiwan)	233	96.28%
Non-Chinese	9	3.72%
<u>Travel frequency (N=242) (How many times did you travel for leisure in the past 2 years?)</u>		
Once or twice	82	33.88%
Three to five times	110	45.45%
More than five times	50	20.66%
<u>TripAdvisor user (N=242) (Did you use TripAdvisor to plan for your leisure trip over the past 12 months?)</u>		
Yes	91	37.60%
No	151	62.40%
<u>TripAdvisor usage (N=91) (How many times did you search on TripAdvisor in the past 12 months?)</u>		
1-3 times	25	27.47%
4-6 times	30	32.97%
7-9 times	9	9.89%
10 times or more	27	29.67%
<u>Information obtained from TripAdvisor (N=91) (What kind of information on TripAdvisor do you use?)*</u>		
Interesting destinations	64	70.33%
Hotel ranking and reviews	69	75.82%
Restaurants	55	60.44%
Others	6	6.59%
<u>No. of reviews read (N=91) (How many reviews did you usually read before leaving a certain page on TripAdvisor?)</u>		
Less than 2 reviews	6	6.59%
3-5 reviews	38	41.76%
6-10 reviews	20	21.98%
More than 10 reviews	27	29.67%

Note: *Respondents can choose more than one answer.

Table 2. *Test of Between-Subject Effects on Perceived Credibility*

Dependent variable PC

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial η^2
Corrected model	80.052 ^a	7	11.436	89.782	0.000 ***	0.729
Intercept	4629.981	1	4629.981	36349.329	0.000 ***	0.994
Review valence (RV)	11.834	1	11.834	92.910	0.000 ***	0.284
Review consistency (RC)	31.574	1	31.574	247.883	0.000 ***	0.514
Reviewer expertise (RE)	30.819	1	30.819	241.958	0.000 ***	0.508
RV * RC	1.377	1	1.377	10.813	0.001 ***	0.044
RV * RE	.754	1	.754	5.918	0.016 *	0.025
RC * RE	.579	1	.579	4.543	0.034 *	0.019
RV * RC * RE	1.762	1	1.762	13.834	0.000 ***	0.056
Error	29.806	234	0.127			
Total	4767.444	242				
Corrected total	109.857	241				

R Squared = 0.729 (Adjusted R Squared = 0.721)_a

Notes: * Significant at 0.05 level; ** Significant at 0.01 level; ***Significant at 0.000 level.

Table 3. *Means and Standard Deviations of Perceived Credibility (Main Effects of Reviewer Expertise, Review Consistency, Review Valence)*

	Experiment Manipulation	Perceived credibility (N=242) Mean (SD)
Reviewer expertise	Expert	4.73 (0.51)
	Amateur	4.02 (0.62)
Review consistency	Consistent	4.73 (0.51)
	Inconsistent	4.02 (0.62)
Review valence	Positive	4.16 (0.71)
	Negative	4.62 (0.55)

Table 4. Means and Standard Deviations of Perceived Credibility

Experiment Manipulation	Perceived Credibility (N=242) Mean(SD)													
	Expert		Positive Amateur		Total		Expert		Negative Amateur		Total		Total	
Review Consistency														
Consistent	4.88	(0.38)	4.32	(0.37)	4.59	(0.50)	5.23	(0.37)	4.56	(0.37)	4.92	(0.50)	4.76	(0.51)
Inconsistent	4.27	(0.33)	3.18	(0.54)	3.76	(0.62)	4.59	(0.40)	4.06	(0.22)	4.32	(0.42)	4.03	(0.62)
<u>Total</u>	4.55	(0.46)	3.76	(0.69)	4.16	(0.71)	4.93	(0.50)	4.29	(0.39)	4.62	(0.55)	4.39	(0.68)

Table 5. Multiple pairwise comparisons

Grp	RC	RE	RV	Mean PC	SD	N		Grp	RC	RE	RV	Mean PC	SD	N	Mean diff	Sig.
A	Inconsistent	Amateur	Negative	4.056	0.216	30	Vs	B	Inconsistent	Amateur	Positive	3.178	0.389	30	0.878	0.000**
C	Inconsistent	Expert	Negative	4.586	0.405	29	Vs	D	Inconsistent	Expert	Positive	4.275	0.333	34	0.312	0.001**
E	Consistent	Amateur	Negative	4.556	0.370	27	Vs	F	Consistent	Amateur	Positive	4.323	0.370	31	0.233	0.014*
G	Consistent	Expert	Negative	5.232	0.368	33	Vs	H	Consistent	Expert	Positive	4.881	0.376	28	0.351	0.000**
A	Inconsistent	Amateur	Negative	4.056	0.216	30	Vs	C	Inconsistent	Expert	Negative	4.586	0.405	29	-0.531	0.000**
B	Inconsistent	Amateur	Positive	3.178	0.389	30	Vs	D	Inconsistent	Expert	Positive	4.275	0.333	34	-1.097	0.000**
E	Consistent	Amateur	Negative	4.556	0.370	27	Vs	G	Consistent	Expert	Negative	5.232	0.368	33	-0.677	0.000**
F	Consistent	Amateur	Positive	4.323	0.370	31	Vs	H	Consistent	Expert	Positive	4.881	0.376	28	-0.558	0.000**
A	Inconsistent	Amateur	Negative	4.056	0.216	30	Vs	E	Consistent	Amateur	Negative	4.556	0.370	27	-0.500	0.000**
C	Inconsistent	Expert	Negative	4.586	0.405	29	Vs	G	Consistent	Expert	Negative	5.232	0.368	33	-0.646	0.000**
B	Inconsistent	Amateur	Positive	3.178	0.389	30	Vs	F	Consistent	Amateur	Positive	4.323	0.370	31	-1.145	0.000**
D	Inconsistent	Expert	Positive	4.275	0.333	34	Vs	H	Consistent	Expert	Positive	4.881	0.376	28	-0.606	0.000**

*Significant at p<or=0.05, **Significant at p=or <0.01

Table 6. *Summary of Analysis Results*

Hypotheses	Results
<i>H1: The perceived credibility of hotel online reviews is higher for reviews written by reviewers with higher level of expertise than for those written by amateurs.</i>	Supported (F=241.958, p=0.000***, partial $\eta^2=0.508$) Expert: M=4.73, SD=0.51 Amateur: M=4.02, SD=0.62 Mean difference: 0.71
<i>H2: The perceived credibility of hotel online reviews is higher for reviews with overall ratings that are consistent with others than for those that are inconsistent.</i>	Supported (F=247.883, p=0.000***, partial $\eta^2=0.514$) Consistent: M=4.76, SD=0.51 Inconsistent: M=4.03, SD=0.62 Mean difference: 0.73
<i>H3: The perceived credibility of hotel online reviews is higher for reviews that are negatively framed than for those that are positively framed.</i>	Supported (F=92.910, p=0.000***, partial $\eta^2=0.284$) Negative: M=4.62, SD=0.55 Positive: M=4.16, SD=0.71 Mean difference: 0.46
<i>H4: A three-way interaction effect of reviewer expertise, review rating consistency, and review valence exist on the perceived credibility of hotel online reviews.</i>	Supported (F=4.543, p=0.034*, partial $\eta^2=0.019$)

Notes: * Significant at 0.05 level; ** Significant at 0.01 level; ***Significant at 0.000 level.