What makes a useful online review?

Implication for travel product websites

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Abstract

While the proliferation of online review websites facilitate travellers' ability to obtain information (decrease in search costs), it makes it difficult for them to process and judge useful information (increase in cognitive costs). Accordingly, this study attempts to identify the factors affecting the perceived usefulness of online consumer reviews by investigating two aspects of online information: (1) the characteristics of review providers, such as the disclosure of personal identity, the reviewer's expertise and reputation, and (2) reviews themselves including quantitative (i.e., star ratings and length of reviews) and qualitative measurements (i.e., perceived enjoyment and review readability). The results reveal that a combination of both messenger and message characteristics positively affect the perceived usefulness of reviews. In particular, qualitative aspects of reviews were identified as the most influential factors that make travel reviews useful. The implications of these findings contribute to tourism and hospitality marketers to develop more effective social media marketing.

Keywords: Travel products; online reviews; usefulness of online reviews

1.0 Introduction

Online reviews have become an important information source that allow consumers to search for detailed and reliable information by sharing past consumption experiences (Yoo & Gretzel, 2008; Gretzel, Fesenmaier, Lee, & Tussyadiah, 2011). According to the report by Vlachos (2012), about 87 percent of international travellers have used the Internet for planning their trips and 43 percent of them have read reviews by other travellers. More specifically, nearly half of online consumers indicated that they actively read and post reviews after experiencing service products (Santos, 2014). This study argues that consumer reviews are particularly important in purchasing experiential goods (e.g., destinations, hotels, and restaurants) because people find it difficult to assess the quality of the intangible products before consumption. Hence consumers tend to rely on online comments (a form of e-word of mouth) that allow them to obtain sufficient information and have indirect purchasing experiences so as to reduce their level of perceived uncertainty (Ye, Law, Gu & Chen, 2011).

Given the recognition of the importance of online reviews, several online communities (e.g., Tripadvisor, Yelp, Citysearch, and Virtualtour) that provide a platform showcasing consumer reviews have gained popularity and in turn have become the leading information source in tourism and hospitality. In this vein, many studies have investigated the effect of online reviews on travel behaviours (Vermeulen & Seegers, 2009) and product sales (Duverger, 2013; Racherla, Connolly & Christodoulidou, 2012; Sparks & Browning, 2011). It is important to recognize that while the abundance of online consumer reviews in travel-related social communities makes it easy for travellers to find information, it is difficult for them to process and judge useful information. More specifically, the extensive travel information available through social media enables people to spend lower costs/efforts that stimulate the search for information online. However, many individuals have a limited capability to process a substantial amount of information, which may bring about information overload (Frias, Rodriguez, & Castaneda, 2008).

In other words, the tendency is to decrease in search costs but increase in cognitive costs (Bellman, Johnson, Lohse & Mandel, 2006). Thus identifying the factors that generate the perceived usefulness of online reviews is a crucial issue in online tourism marketing as online sites with more useful reviews offer greater potential value to customers and contribute to building their confidence in making a purchase decision (Sussman & Siegal, 2003).

This study explores two key elements in online reviews including the characteristics of review providers and of consumer reviews themselves in order to predict perceived usefulness. Within the online environment, offering limited cues of peer recognition and a disclosure of personal information (e.g., real photo, name and address) and online reputation in the community have a large influence on the way consumers respond to messages (Forman, Ghose, & Wiesenfeld, 2008). Furthermore, the extant literature has discussed the importance of the numerical ratings of the reviews assigned by readers and examined their effects on the purchase decision process (Poston & Speier, 2005), search costs (Todd & Benbasat, 1992), and product sales (Duan, Gu & Whinston, 2008). However, the authors of this research argue that such quantitative characteristics of online reviews can explain a partial aspect of review effectiveness due to limited cognitive cues for recipients to identify the differences between numerous reviews. This study thus suggests a research approach combining not only quantitative (i.e., length of reviews and star ratings) elements of information but also qualitative/textual (i.e., perceived enjoyment and readability of reviews) aspects to better explain the perceived usefulness of online reviews (Mudambi & Schuff, 2010; Van der Heijden, 2003).

Therefore, the purpose of this research is to identify factors important to reviewers (i.e., identity disclosure, expertise, and reputation) and composing online reviews (i.e., quantitative including star ratings and length of reviews, and qualitative measurements containing perceived enjoyment and review readability), both of which affect information evaluation online. In order to address the research purpose, this study analyses over 5,000 online reviews of travel products posted by online consumers. The findings of this research contribute to the ability of tourism and hospitality marketers to develop more effective online marketing strategies.

2. Literature Reviews

2.1 Online consumer reviews

The studies regarding online consumer reviews have focused their attention on two aspects: (1) the consumer decision making process and (2) product sales. The research into the effect of online reviews on consumer purchasing behaviour has largely discussed the concepts of trust and credibility in online reviews, based on the assumption that the uncertainty of product quality exists in the online environment. For example, when online consumers view a product listing on a shopping website (e.g., auction and retail websites), they may not have easy access to information about the ‘true’ quality of the product and therefore may not be able to judge precisely a product’s quality prior to its purchase (Fung & Lee, 1999). The difference between the information sellers and buyers possess refers to information asymmetry (Pavlou & Dimoka, 2006). Since online consumers have to rely on the electronic information with a lack of ability to physically investigate the product, people are likely to involve additional risk along with the incomplete or distorted information provided by online sellers (Lee, 1998). Ba and Pavlou (2002) identified that the appropriate feedback mechanisms, including positive and negative ratings, induce trust in online sellers and mitigates information asymmetry by reducing transaction risks.

Mudambi and Schuff (2010) investigated the helpfulness of reviews based on the statement that helpfulness as a measure of perceived value in the decision-making process reflects information (i.e., online review) diagnosticity. They identified the positive effects of review depth (or elaborateness) on the perceived helpfulness of the review. Baek, Ahn, and Choi (2012) investigated review credibility by performing sentiment analysis for mining review text. Based on the dual process theory, they found that consumers tend to focus on different information sources of reviews. Specifically, peripheral cues (i.e., star ratings and rankings of the reviews) are useful in the information search stage whereas central information processing (i.e., the number of total words in a review and the number of negative words) is influential in the stage of the evaluation of alternatives. Hu, Liu, and Zhang (2008) concluded that online consumer reviews infer product quality and reduce product uncertainty, in turn aiding the final purchase decision.

A number of previous researchers have examined the relationship between online reviews and product sales. Chevalier and Mayzlin (2006) found a positive relationship between consumer reviews on retailing websites and book sales (e.g., Barnes & Nobel and Amazon.com). They also identified that the valence (average numerical rating) (Dellarocas, Zhang & Awad, 2007) and number of online consumer reviews (Duan et al, 2008) are vital predictors of box office sales. Clemons, Gao, and Hitt (2006) showed that not only the variance of ratings but also the strength of the most positive quartile of reviews has a significant impact on the growth of craft beers. In addition to the features of online reviews, the effect of the degree to which review writers disclose their identity in the evaluation of product quality and product sales has been discussed (e.g., Forman, et al., 2008). While a number of researchers have concluded that an improvement in the review score leads to an increase in relative sales online, Chen and Wu (2005) and Duan et al. (2008) demonstrated that high product ratings do not necessarily lead to increased sales. They explained that consumers' tastes could be heterogeneous to the extent that the ways in which consumers use other consumers' opinion in their purchase decision are different.

From the tourism and hospitality perspectives, several researchers have investigated the role of online reviews in the decision making process for general trips (Xiang & Gretzel, 2010), hotels (Sparks & Browning, 2011), and restaurants (Racherla & Friske, 2012), as well as in estimating the market shares of travel products, such as hotels (Duverger, 2013; Ogut & Tas, 2012) and restaurants (Zhang, Ye, Law & Li, 2010). Vermeulen and Seegers (2009) investigated the impact of online hotel reviews on the formation of consumer consideration, and found out that online reviews improve hotel awareness, which ultimately helps travellers to develop their consideration set. Ye et al (2011) estimated the effect of online review features on room sales in hotels based on the assumption that the number of reviews encompasses the linear function of sales. They concluded that review ratings and room prices are important elements to predict room sales online. The studies by Zhang et al (2010) analysed online information reflecting context-specific variables in restaurants (e.g., food quality, environment and services) as well as the number of reviews and review ratings of the online popularity of restaurants.

2.2 Perceived usefulness of online reviews

Many review websites have designed peer reviewing systems that allow people to vote on whether they found a review useful in their decision making. For instance, Amazon.com provides a service that displays the top two most helpful, favourable, and critical reviews posted by online users in order to help its customers evaluate each displayed product easily. These useful votes are generally believed not only to be an indicator of review diagnosticity to separate the useful reviews from the rest (Mudambi & Schuff, 2010), but also to be a signalling cue for users to filter numerous reviews efficiently (Ghose & Ipeirotis, 2008). In other words, the useful information in a review may assist customers to evaluate the attributes of the service so as to build confidence in the source (Gupta & Harris, 2010). That is, the possibility to make better decisions and experience greater satisfaction with the online platforms can be increased when information seekers encounter numerous pieces of useful information that affect their decisions. This implies that online sites with more useful reviews offer greater potential value to customers and contribute to building confidence in their purchase decisions.

From the online retailers' perspective, review usefulness can be used as the primary way of measuring how consumers evaluate a review (Mudambi & Schuff, 2010). It is beneficial for marketers to gain knowledge about customers' perception of information. Kumar and Benbasat

(2006) asserted that the presence of useful reviews on a website can improve its social presence. That is, those reviews have the potential to attract consumer visits, increase length of time to stay in the platform, and eventually increase the sales of businesses on the site. Accordingly, online retailers are encouraged not only to provide easy access to useful messages that can create a source of differentiation but also establish the strategic potential to improve the quality of customer reviews to offer greater value to customers.

2.3 Factors affecting the perceived usefulness of online reviews

Previous studies which interpret the perceived usefulness of a review as a key determinant of consumers' intent to comply with it (Cheung, Lee & Rabjohn, 2008), have paid attention to identifying the factors affecting information usefulness. Most studies have mainly investigated the characteristics of consumer reviews, particularly for quantitative attributes, including review ratings and elaborateness of reviews (e.g., counting words) (Chevalier & Mayzlin, 2006; Mudami & Schuff, 2010). Recently, several researchers in information systems suggested the importance of presenting a messenger's identity (e.g., identity disclosure) in developing confidence in the information. For example, Racherla and Friske (2012) investigated the effects of three types of reviewer characteristics and concluded that the levels of a reviewer's reputation and expertise significantly affect the usefulness of online reviews. More importantly, the authors of this study suggests that considering the qualitative elements of the online information reflects 'source effects' with regard to persuasive communication (Janis & Hovland, 1959). Schindler and Bickart (2012) stated that the message contents and styles are vital factors which make the reviews appealing to consumers. Accordingly, the perceived enjoyment suggested by Mathwick and Rigdon (2004) and readability of reviews proposed by Korfiatis, Garcia-Bariocanal and Sanchez-Alonso (2012) are analysed in this study as measurements for qualitative elements of online messages. This research attempts to estimate three aspects of online review related factors: (1)

messenger element (i.e., identity disclosure, expertise, and reputation), (2) quantitative facets of online messages (i.e., review valence and elaborateness) and (3) the qualitative facet of the messages (i.e., enjoyment and readability of the reviews). Detailed discussions about the relationships between these factors and perceived usefulness are presented in the following sections.

[Insert Figure 1 here]

2.3.1 Messenger factors

Reviewers' identity disclosure

Online identity is defined as a social identity that an individual establishes in online communities and/or websites. It is a way of presenting oneself that helps others find one's personal profile or geographic location. Although many members of the online community are concerned that people's identity disclosure is pertinent to privacy issues (discouraging them from allowing themselves to be named in the text) (Nabeth, 2005), precise information about message providers can bring salient contributions to recipients' perception of the message.

Prior studies have demonstrated the importance of identity disclosure in online interaction, arguing that identifiable sources enhance the efficiency of customers' information acquisition (Racherla & Friske, 2012). Source identity also plays a significant role in reducing customers' uncertainty, which arises from the lack of social cues when they search for information in the online environment (Tidwell & Walther, 2002). Sussman and Siegal (2003) emphasized that the disclosure of reviewer identity leads to an increase in the message's credibility and, as a result, the source is perceived to be more useful (Kruglanski et al, 2006). Fogg et al (2001) demonstrated that reviewers' names and photos in the online information source have a positive relationship with people's perception of the credibility of websites on the basis of the information processing theory

(Mackie, Worth & Asuncion, 1990). Forman, et al. (2008) pointed out that message recipients may use the personal information of the message creator as a heuristic cue, drawing on the evaluation of the information provider as a cognitive device to assist them to reach judgements and actions. Thus, reviews developed by online users who disclose their personal identities may increase the credibility of the information source and thus the reviews could be judged as more useful. Therefore, it is hypothesized that:

Hypothesis 1a (*H_{1a}*): Reviewers' disclosure of their identity has a positive effect on the perceived usefulness of their reviews.

Reviewer expertise

When consumers search for information to help them make a decision, they are inclined to follow an expert's suggestion (Gilly, Graham, Wolfinbarger, & Yale, 1998). Online information provided by an expert is considered to be more useful and to have more influence on attitudes toward the product and purchase intentions than non-expert ones (Harmon & Cone, 1982; Lascu, Bearden & Rose, 1995). Bristor (1990:p.73) referred to expertise as 'the extent to which the reviews provided by experts are perceived as being capable of providing correct information and they are expected to prompt reviewers' persuasion because of their little motivation to check the reliability of the source's declarations by retrieving their own thoughts'. Gotlieb and Sarel (1991) also asserted that the indicator of an 'expert' message is determined by the evaluation of the degree of competence and knowledge that a message holds regarding specific topics of interests. However, the limited online setting makes it difficult for people to make such an evaluation given the availability of personal information (Cheung et al., 2008; Schindler & Bickart, 2005). In other words, message providers' social background and attributes cannot be verified for the level of product knowledge in the online environment with limited cues. Evaluations of messengers' expertise, therefore, have to rely on their past behaviours (Weiss, Lurie & MacInnis, 2008): for example, the number of reviews written, information provided in response to others' queries, and the opinions of the present message. Cheung, et al. (2008) discovered that when a consumer seeks comments posted by a high degree of expertise user, he/she tends to have a higher perception of usefulness of the information. Therefore, the following hypothesis can be formulated:

Hypothesis 1b (H_{1b}): A high level of reviewer expertise has a positive effect on the perceived usefulness of a review.

Reviewer reputation

In addition to expertise, the reputation of reviewers is a core indicator that differentiates one reviewer from the others. As defined by Helm and Mark (2007), reputation is the extent to which recipients believe that a reviewer is honest and concerned about others and constant in the long term. Prior research has argued that reputation and peer recognition can significantly enhance the degree to which information sharing influences customers' perceptions of product value and likelihood of recommending the product (Gruen, Osmonbekov & Czaplenski, 2006). Online review providers who provide a substantial amount of effort writing reviews are eager for other consumers to provide their contributions with positive feedback in the form of friendship requests or votes (Racherla & Friske, 2012). Many review websites related to tourism and hospitality (e.g., Yelp.com and TripAdvisor.com), therefore, have established an online reputation system to assist users to find the reputation of others by collecting, distributing, and aggregating the feedback associated with the reviewers' past behaviour in the online community (Resnick, Zeckhauser, Friedman, & Kuwabara, 2000).

From the social psychological perspective, reputation effects essentially signal social validation and improve credibility (Cialdini, 2001). As such, consumers can utilize reputation as an indication of the quality of information to reduce uncertainties regarding information quality (Helm & Mark, 2007; Resnick et al., 2000). Due to the features of the online environment involving limited interaction compared with face-to-face communication, the reviews provided by high-status messengers can create greater compliance in online groups, so reputation can be used as a heuristic cue (Guéguen & Jacob, 2002). Hence, the relationship between reputation and review usefulness is formulated as follows:

Hypothesis 1c (*H_{1c}*): Reviewers' high reputation has a positive effect on their reviews' perceived usefulness.

2.3.2 Message characteristics

2.3.2.1 Quantitative characteristics

Review star ratings

Review star ratings refer to the number of stars allocated by the reviewers, indicating their assessment of the products/services used. Peer rating is considered as a useful cue to reflect the extent of consumers' attitude and in turn helps consumers to evaluate the quality of the products (Krosnick et al., 1993). Willemsen, Neijens, Bronner, and de Ridder (2011) defined those ratings as numeric summary statistics (overall ratings) shown in the form of five-point star recommendations at the surface level of the review and reviewers' general assessments of the product. The extant literature has demonstrated an association between online review ratings and customer behaviours (Clemons et al., 2006; Park, Lee, & Han, 2007). The findings of previous studies can be presented in relation to two different arguments. First, a linear relationship has been identified. Online consumer reviews with positive ratings for search goods may exert a significant effect on consumers' attitudes and evaluations of the experience product (Zhang, et al., 2010). Second, online consumers usually perceive positive or negative ratings (i.e., one- and five-star ratings) as more useful than moderate ratings (i.e., three-star ratings) (Danescu-Niculescu-Mizil, Kossinets, Kleinberg, & Lee, 2009). Wei, Miao, and Huang (2013) found that reviews offered by those who give lower hotel ratings tend to be perceived more helpful. Therefore, the relationship between review ratings and review usefulness can be assumed as the following:

Hypothesis 2a (H_{2a}): The star ratings of online reviews have a positive relationship with the perceived usefulness of the reviews.

Review elaborateness

The concept of review content is usually defined as the extensiveness/depth of the information offered in the review (Racherla & Friske, 2012). Essentially, online reviews are informational cues that facilitate customers' evaluation of specific attributes of products and services. Shelat and Egger (2002) pointed out that the elaborateness of online reviews represents the length of the reviews and showed a positive influence on shopping intentions. Mudambi and Schuff (2010) also found that longer reviews include detailed product information regarding how and where the product was purchased and used in specific contexts. Recent studies have asserted that the elaborateness of messages can play a powerful role in the message persuasion process. That is, online reviews with elaborate information contribute to the alleviation of customers' uncertainty about the product quality and lead them to develop confidence in the decision process (Johnson & Payne, 1985). Hence, the hypothesis is formulated that:

Hypothesis 2b (H_{2b}): Reviews with longer text have a positive effect on the perceived usefulness of the reviews.

2.3.2.2 Messages' qualitative characteristics

Customer perceived enjoyment

Perceived enjoyment (PEN) can be defined as the extent to which the reading and understanding of reviews are perceived to be enjoyable in their own right, apart from any performance consequences that may be anticipated (Davis, Bagozzi & Warshaw, 1992). It is considered as a qualitative factor presenting individuals' feeling of pleasure, depression, disgust, or hate associated with a particular act (Triandis, 1980). Prior studies discussing motivation theory have indicated that a certain human behaviour (e.g., the usage of information technology) is determined by both intrinsic and extrinsic motivation (Davis, et al. 1992; Van der Heijden, 2003). Perceived enjoyment has been considered as intrinsic motivation, which drives the performance of an action that is not undertaken for any reason other than the process of performing the activity per se. As such, intrinsic motivation can lead to user behaviour. In terms of user–computer interaction, Mattila and Wirtz (2000) stressed that consumers' affective reaction is important as a cognitive process to understand consumer behaviour and, in particular, emotion is essential in the evaluation process of products. Furthermore, intrinsic motivation enhances the deliberation and thoroughness of cognitive processing, which leads to perceptions of perceived usefulness (Venkatesh, Speier & Morris, 2002). Based on these findings, it is assumed that the enjoyment vote in each review represents the recipients' perception of enjoyment and an expected correlation with the perceived usefulness of online reviews:

Hypothesis 3a (H_{3a}): The reviews that indicate perceived enjoyment by recipients have a positive effect on perceived usefulness of the reviews.

Review readability

Online reviews are information resources that consumers utilize to gain knowledge about products and services. Zakaluk and Samuels (1988) stated that the extent to which an individual requires to comprehend the product information can present the level of readability. As noted earlier, understandability is thought to be an important qualitative factor to display the extent to which customers accept online information on social media platforms. Thus, a readability test can be used as a measurement of the degree to which a piece of text is understandable to readers based on its syntactical elements and style. According to the linguistic characteristics, the method to calculate readability is considered as a scale-based indication of how difficult a piece of text is for readers to comprehend (Korfiatis, et al., 2012). Table 1 lists the readability tests used in the present study. As identified by Gunning (1969), Gunning's Fog Index (FOG) is an indication of the level at which people who have an average high school education would be able to understand a particular text. Similar to FOG, the Flesch–Kincaid Reading Ease Index (FRE) is a linguistic measurement to calculate the words per sentence and syllables per word in a given text (Kincaid, Fishburne, Rogers, & Chissom, 1975). FRE can be used to evaluate the complexity of the text in order to determine the number of years of education that would be needed for someone to understand the text being assessed. Another well-known readability test, namely the Automated Readability Index (ARI), focuses on the simple approach of calculating the amount of words and characters to evaluate the given text's readability (Senter & Smith, 1967). The fourth method is the Coleman–Liau Index (Coleman & Liau, 1975), which is similar to the ARI in providing a simpler evaluation and more careful selection of review characteristics. In summary, the FRE and ARI scores measure the reading ease of each review, whereas the CLI and FOG indexes present the complexity of the text. Therefore, a hypothesis that the readability of the review content would positively affect the review usefulness is formulated:

Hypothesis 3b (H_{3b}): The readability of the review text has a positive effect on the perceived usefulness of the review.

[Insert Table 1 here]

3. Research Methodology

3.1 Research context

This research collected data from Yelp.com in the form of online customer generated reviews. First, Yelp.com is one of the most popular online advisory sites dedicated to allowing customers to share and post information about tourism and hospitality products across major cities in the world (Yelp.com, 2013). Schein (2011) pointed out that Yelp.com is the largest business-listing website, which has amassed over 42 million reviews about local businesses, and is more popular than any of its rivals, like TripAdvisor.com and Citysearch.com. Second, Yelp.com can avoid language comprehension heterogeneity between informants and recipients, which might have a negative influence on text comprehension. To measure the qualitative element of the reviews, Korfiatis, et al. (2012) proposed that the analysis of textual characteristics is pointless when the reader is a non-native speaker of the written language. Thus, Yelp.com allows the researchers to obtain sufficient online review information as well as to control the confounding effect during the data collection.

3.2 Data collection

3.2.1 Research sampling

In total, 5,090 online reviews were collected during summer 2013. This research examines online reviews of restaurants because this category constitutes the majority of the reviews on the website (Yelp.com, 2011) and consumers are inclined to resort to signals (useful votes) for evaluating these attributes. Moreover, it is highly recommended to obtain data from the leading restaurant market in this research context: for example, London in the United Kingdom, and New York City in United States. The London tourism market, including the food and hospitality sectors, reached a total of £79.7 billion in 2013, which represents one of the best economies in Europe and has grown twice as fast as the rest of the UK (SagitterOne, 2013). Lushing (2012) reported that New York City is one of top five cities with the most restaurants as an indicator of the restaurant market share. Apart from the size of the market, these two cities are also listed in Yelp's top 100 places to eat in each country (Yelp, 2014). These statistics indicate that two selected cities encompass large supply and demand of restaurant sectors so that the findings have limited bias relevant toward the specific context of the research setting. The researchers of this study collected 2,500 (35 restaurants) reviews and 2,590 (10 restaurants) reviews about restaurants located in London and New York City, respectively, in order to reduce the effect of geographical issues. Note that, in general, the number of consumer reviews for restaurants located in New York are relatively larger than the restaurants in London. To extract a consistent number of reviews as an individual sample in this study, restaurants in London have been selected more than the restaurants in New York City. Furthermore, the price level of the restaurants ranged from budget to luxury prices, based on four categories of price groups assigned by the online review website.

The literature about consumer behaviour has suggested that prior knowledge of a product/service affects the external information search and evaluation as well as the final decision (Gursoy & McCleary, 2004). Thus, the restaurants selected for this research exclude national and regional chains; rather, local restaurants are focused on to ensure a valid sample. As suggested by Racherla et al. (2012), a restaurant's position on the website page has a profound impact on users' perception. The authors of this research, therefore, focused on the top-ranked businesses on the first page due to high level of attention to those restaurants displayed on the first two pages. In order to control the listing of restaurants in a specific order, the collection process operates in a random way instead of dictating the targeted data in high/low rankings or alphabetical order.

3.2.2 Operationalization of data variables

This study used reviewer and review information retrieved from the selected sample shown in Figure 2, presenting all the variables utilized for this research. To be more specific, the dependent variable is online review usefulness (PU) measured by counting the number of online users who voted that the reviews were useful in response to the reviews posted (Ghose & Ipeirotis, 2010; Jin, Lu & Shi, 2002). The independent variables, including the messenger's name, address, and real photo, are binary variables to be measured as '1' if they disclose information and '0' otherwise. The website requires providing background information during the registration process, including name, address, and a photo. The researchers of this study manually checked if members indicate their full names or just provide initials (e.g., M. T.) (see Baek et al., 2013; Forman et al., 2008; Racherla & Friske, 2012). To determine whether the user has a real photo, we checked if the reviewers use real photos clear enough to identify their faces or provide no animations and screen shots (e.g., a scene and status). To verify address, we determined if a reviewer provided information about their residence in their profiles such as city, state and country.

The number of reviews that messengers have written represents their expertise, and reviewers' reputation is calculated by the number of their friends, fans and Elite awards (Forman et al, 2008; Racherla & Friske, 2012; Weiss, et al., 2008). To capture the features of reviews, the number of words in each review and the rating that the reviewer gave from one to five stars were collected as quantitative characteristics (Chevalier & Mayzlin, 2006; Mudambi & Schuff, 2010). For qualitative characteristics, the perceived enjoyment was estimated by checking the number of readers who clicked the funny and cool voting systems at the end of a review (Van der Heijden, 2003). Last, four types of readability methods were taken into account for each review: ARI, CLI, FOG, and FRE (Korfiatis, et al., 2012).

[Insert Figure 2 here]

3.3 Data analysis

This study used the TOBIT regression model to analyse the data due to the specific feature of useful votes (dependent variable) and the censored nature of the sample (Mudambi & Schuff, 2010). The first reason for choosing the TOBIT model is that the dependent variable is bounded in its range and the distribution is skewed in one direction. More specifically, the distribution of the data about useful votes (dependent variable) appears to be skewed to the left side: 96 per cent of the data is in the range between '0' and '5', with '65' as the maximum value. Thus, this study focused on the reviews voted lower than 6 (valid sample: N = 4,908 reviews) to control the outliers. The second reason for applying the TOBIT model is that the regression method is a useful analysis for estimating the relationship between a non-negative dependent variable and a set of independent variables (Long, 1997). In a similar vein, the TOBIT model has the potential to solve the selection bias inherent in this research context. For example, counting the number of people who have read a certain review is hard on an online platform. Rather, researchers can recognize how many of those online users voted that they perceived the review as useful and the number of enjoyment votes on a review. As such, it is possible for a review to receive a zero response to the 'useful' votes, meaning that readers perceived that the particular review is not useful when it is read. The OLS model, in general, is an effective method to illustrate the correlations between variables. However, OLS regression has a potential restriction that regards a zero value as a missing value, while it actually presents customers' perception of reviews in this research context (Kennedy, 1994). Compared with the OLS model, the TOBIT model can present the real value of each review, which has zero useful votes if the case meets the conditions to be regarded as zero. Based on the censored nature of the dependent variable and the potential selection issues, this current study, therefore, performed TOBIT regression to analyse the data and measured the fit with the likelihood ratio and Efron's pseudo R-square value (Long, 1997).

4. Results

4.1 Descriptive analysis of the variables

Table 2 provides the descriptive statistics for the main variables of the data set. It is interesting that most messengers provided real names (N = 4,681, 95.4%), photos (N = 3,499, 71.3%) and addresses (N = 4,858, 99.0%), indicating that the level of identity disclosure is quite high. With regard to the other variables of the review providers, expertise (mean = 157.65, SD = 283.45), friends (mean = 78.68, SD = 245.25) and fans (mean = 10.67, SD = 42.17) show relatively large variance compared with Elite awards (mean = 1.16, SD = 1.77).

Looking at the variable about useful votes, on average, each review has one useful vote to represent the probability of evaluating the perceived usefulness of online consumers. In addition, the average review star rating was 4.28 (SD = 0.88), with an average text length of 138.42 (SD = 119.53) words. In terms of message qualitative characteristics, the review enjoyment shows the distribution from a minimum of 0 to a maximum of 36. The values of the readability test vary across the four methods, FOG (mean = 9.23, SD = 3.17), ARI (mean = 6.21, SD = 3.87), CLI (mean = 7.08, SD = 2.52) and FRE (mean = 81.62, SD = 13.05).

[Insert Table 2 here]

4.2 Hypothesis testing

Initially, a correlation analysis including all of the variables to estimate was conducted. Correlation values shown at Table 3 indicate acceptable levels with little concerns for variables of 'expertise' and readability indexes (around .80). However, Tabachnick and Fidell (2007) stated that "The statistical problems created by singularity and multicollinearity occur at much higher correlations (.90 and higher)" (pp. 90). Furthermore, this study conducted a series of statistical estimations for multicollinearity in regression analysis (see Appendix A).

[Insert Table 3 here]

Model 1, shown below, reflects the hypothetical relationships between messenger factors and perceived usefulness (PU), referring to H_{1a}, H_{1b}, and H_{1c}.

$$\text{Model 1: PU} = \beta_{11}{*}RealName + \beta_{12}{*}RealPhoto + \beta_{13}{*}RealAddress + \beta_{14}{*}Expertise + \beta_{15}{*}Friends + \beta_{16}{*}Fans + \beta_{17}{*}EliteAward + \varepsilon_1$$

The results of the regression analysis for Model 1 are shown in Table 4 (log likelihood = -6642.81). As this study proposed, RealName ($b = .30$) in a marginal manner ($p < .10$) and RealPhoto ($b = .66$; $p < .001$) were statistically significant, while RealAddress ($b = 1.50$) was not insignificant regarding perceived usefulness. In addition, the number of friends ($b = .0007$; $p < .001$) and Elite awards ($b = .18$; $p < .001$) as well as fans ($b = .002$; $p < .10$) within the marginal level positively influenced the dependent variable (perceived usefulness). These variables explained about 3 per cent of the variance of perceived usefulness ($R^2 = 0.03$).

[Insert Table 4 here]

Model 2 reflects the hypothetical relationships between the quantitative characteristics of review messages and perceived usefulness, referring to H_{2a} and H_{2b}.

Model 2: PU = β_{21}*RealName*+β_{22}*RealPhoto*+β_{23}*RealAddress*+β_{24}*Expertise*+ β_{25}*Friends*+β_{26}*Fans*+β_{27}*EliteAward*++β_{28}*Rating*+β_{29}*Rating*^{2}+β_{210}*WordCount*+ε_2

Model 2 was estimated by adding the variables about the quantitative characteristics of reviews from Model 1, including the star rating, square of the star rating and word count. All three factors showed statistically significant results. The relationship of the star rating is interesting: the star rating (b = .37, $p < .001$) and the square of the star rating (b = .16, $p <.001$), which implies a positive and U-shaped pattern together, were both statistically significant. When comparing coefficient values, this research emphasized the positive relationship. That is, online reviewers tend to assign a higher level of usefulness to the reviews that provide positive star ratings. This finding is consistent with studies investigated by Wei et al. (2013). Word counts (b = .003, $p <$ .001) positively affected the perceived usefulness of the reviews. This means that as the online reviews included a larger number of words, consumers were more likely to perceive the usefulness of the contents. Despite the significant results of the quantitative measurements, the number of significant reviewer-related factors diminished into two variables: the existence of real photos (b = 0.6028, $p < .001$) and the number of friends (b = .0007, p < .01). As a result, Model 2 accounted for about 4 per cent of the variance of the perceived usefulness ($R^2 = 0.04$) (see Table 5).

[Insert Table 5 here]

Model 3 reflects the hypothetical relationships between the qualitative characteristics of the review message and the perceived usefulness, referring to H_{3a} and H_{3b}.

Model 3: PU = $\beta_{31}*RealName+\beta_{32}*RealPhoto+\beta_{33}*RealAddress+\beta_{34}*Expertise+\beta_{35}*Friends+\beta_{36}*Fans+\beta_{37}*EliteAward+\beta_{38}*Rating+\beta_{39}*Rating^2+\beta_{310}*WordCount+\beta_{311}*EnjoymentVotes+\beta_{312}*FOG+\beta_{313}*FRE+\beta_{314}*ARI+\beta_{315}*CLI+\varepsilon_3$

Model 3 additionally contains enjoyment votes and the four types of readability metrics, to test mainly the relationships between the qualitative characteristics of online reviews and the perceived usefulness. Overall, the variables reflecting the qualitative characteristics increased considerably by an additional 11 per cent (Pseudo $R^2 = 0.13$; $\Delta R^2 = 0.11$) compared with Model 1. In particular, perceived enjoyment had a greater coefficient value than any other variables, referring to one of the most important elements to predict the dependent variable (b = .50, $p < .001$). Of the four readability tests, the Flesch Reading Ease Index, positively affected the perceived usefulness (b = .01, $p < .05$), whereas the Automated Readiblity Index was marginally significant (b = .02, $p < .01$). Referring to the definition of the readability tests, the FOG and CLI scores are the measurements of text complexity, whereas the FRE and ARI scores reflect the ease of reading the reviews. It was found that review complexity has no effect on online users' perceived usefulness of the information; however, the ease of reading the reviews was regarded as an important element in judging the usefulness. Interestingly, comparing the coefficient values between FRE and word counts, it can be said that qualitative characteristics present a greater effect than merely counting the number of words in the consumer reviews (see Table 6).

[Insert Table 6 here]

5. Discussion

5.1 Messengers' factors

The findings of this research reveal that reviewers' identity disclosure has a significant impact on review usefulness. Based on the assumption that message recipients use social information about the source of a review as a heuristic factor to judge message providers' reliability (Chaiken, 1987), the result of this research shows that reviews with self-disclosure are evaluated as more useful. That is, online consumers respond more positively to reviews including social information than non-identifiable online sources (Jarvenpaa & Leidner, 1999; Xia & Bechwati, 2008).

Moreover, we identified that the variable of expertise has no significant relationship with the review's usefulness. This is in contrast to the results of the previous literature that expertise enhances message persuasiveness and credibility (Belch & Belch, 2011). One possible explanation for this inconsistent finding may lie in the conceptualization of expertise: the definition of expertise in this study refers to the source's level of expertise (i.e., cues provided by a system to present how many reviews a messenger posts on the website). It reflects a slightly different approach from previous studies: for example, Biswas, Biswas and Das (2006) asserted that a perceived 'expert' is related to a great deal of knowledge on a particular topic rather than a generalized level of knowledge. Another explanation is that the role of the information provider's reputation varies according to the different goals of information seekers online between a learning orientation and a decision-making orientation (Weiss, et al., 2008). This implies that understanding the motivations of online information recipients to check reviews is an important research subject recommended for future research.

Furthermore, the results regarding the number of friends, fans, and Elite awards strongly support the notion that the messages written by the information providers with a high reputation are perceived as more useful than reviews posted by those who have a low reputation. As asserted in the previous sections, such a reputation mechanism can reduce the uncertainties regarding service quality and performance because they help customers to identify whom to trust for their decision making. This finding also emphasizes the importance of a reputation system in maintaining the valuable consequence of peer recognition for both message creators and recipients (Jeppesen & Frederiksen, 2006).

5.2. Messages' quantitative characteristics

The results show that positive reviews are perceived as more useful than either negative or moderate reviews. As explained by Russo, Meloy, and Medvec (1998), positive information in valence evaluation that is consistent with a customer's pre-decisional preference provides validation for their interests in the tourism industry and is thus perceived to be more useful. Interestingly, however, the findings of this study indicated both positive and quadratic relationships. This suggests for the future research to investigate the links between star ratings and review usefulness/helpfulness. Other than review ratings, the empirical results also imply that message recipients perceive reviews with longer text to be more useful than those with shorter text. This result is similar to the findings of recent eWOM research (e.g., Chevalier & Mayzlin, 2006; Mudambi & Schuff, 2010). Racherla and Friske (2012) concluded that longer reviews relatively contain more information about the product, which helps consumers to obtain indirect consumption experiences.

5.3. Messages' qualitative characteristics

The empirical study supports the notion that perceived enjoyment and readability metrics are two stronger determinants of customers' perception of usefulness when evaluating online information. To be specific, the analysis of the affective factor of enjoyment shows a greater impact than the other variables, implying that the influence of reviews' qualitative characteristics on their usefulness moves beyond the impact of messengers' social information as well as messages' quantitative features. Prior research highlighted that individuals seek hedonic information in the computer-mediated environment to satisfy their entertainment purposes and eventually to bring about actual behaviours (Atkinson & Kydd, 1997).

In addition to customer perceived enjoyment, the readability of the message content appears to be an important predictor of reviews' usefulness. An interesting finding is that just measurements estimating the ease of reading reviews (ARI and FRE scores) show a significant relationship with perceived usefulness. This finding suggests that online consumers would be likely to search for tourism product reviews that are easy to read, which facilitates them obtaining the specific information necessary within the overwhelming amount of reviews posted online. This finding is coincided with the argument of Dillard, Shen and Vail (2007) that consumers would prefer reviews that are 'playful, useful and understandable' rather than reviews with complicated content.

6. Implications

The implications of this study can be explained through two fields: theoretical and managerial aspects. This research takes an important step towards identifying the factors that drive customers' perception of the usefulness of online reviews. First, the findings of this paper highlight that review messages' qualitative characteristics (i.e., perceived enjoyment and readability) make greater contributions to explaining the review usefulness beyond the other characteristics, such as messengers' and reviews' quantitative factors. Moreover, this paper attempts to assess the combination of all the factors related to online reviews, which allows the researchers to develop a comprehensive model so as to estimate the relative importance of predicting review usefulness. Along with the theory of information diagnosticity that refers to the extent to which the consumer believes the product information is helpful to understand and evaluate products (Herr, Kardes, & Kim, 1991), the findings of this research sheds light on the multi-aspects of information attributes to improve the perceived diagnosticity. In the online environment where consumers have limited capability to diagnose the integrity of the product information, especially for the experience goods, the information about reviewer's identity and previous experiences in the online community and also message related attributes (such as the quantitative elements and features representing the quality of online reviews) improves the perceived usefulness (i.e., perceived information diagnosticity) (Mudambi & Schuff, 2010).

With the online environment in which online travellers are now facing a large number of online consumer communities and reviews competing for a portion of their viewing time, the findings of this research provide a number of practical implications to develop online marketing strategy in tourism and hospitality. First, online community should disclose details of the information providers' identity, such as their names, addresses and photos as reviewers' identity disclosure is likely to spur other readers to perceive the usefulness of the reviews. In the same vein, online marketers are recommended to develop a system to award the Elite rating to certain review posters by considering not only the number of times they have left a review but also the contents of the reviews itself so that online consumers can trust the authorized Elite award. Since positive reviews of product experiences are more influential than negative reviews, tourism and hospitality marketers should pay more attention on positive reviews by responding to the reviews in effective ways. Last, online tourism marketers need to find reviews that make readers joyful and are easy to read, and regularly update them to be displayed on the front pages.

7. Conclusion

With the growing availability and popularity of web-based opinion platforms, online reviews are now an emerging market phenomenon that is playing an important role in consumer decision making process. People can easily obtain a substantial amount of information from the consumer review websites. However, with regard to bounded rationality (Payne, Bettman, &

Johnson, 1992), the marketers need to offer selected information useful to their consumers in order to alleviate cognitive cost in the information evaluation. To do so, this study investigated three aspects of online reviews in predicting perceived usefulness of the consumer reviews, including (1) reviewer's characteristics, (2) quantitative facet, and (3) qualitative facet of review characteristics. Consequently, this research delineates specific aspects of online reviews that consumers use to assess the usefulness of consumer generated contents. By investigating online comments posted by actual consumers (i.e., secondary data), this study aims to provide a blueprint for analysing the nature and role of online reviews in better understanding travel information search behaviours.

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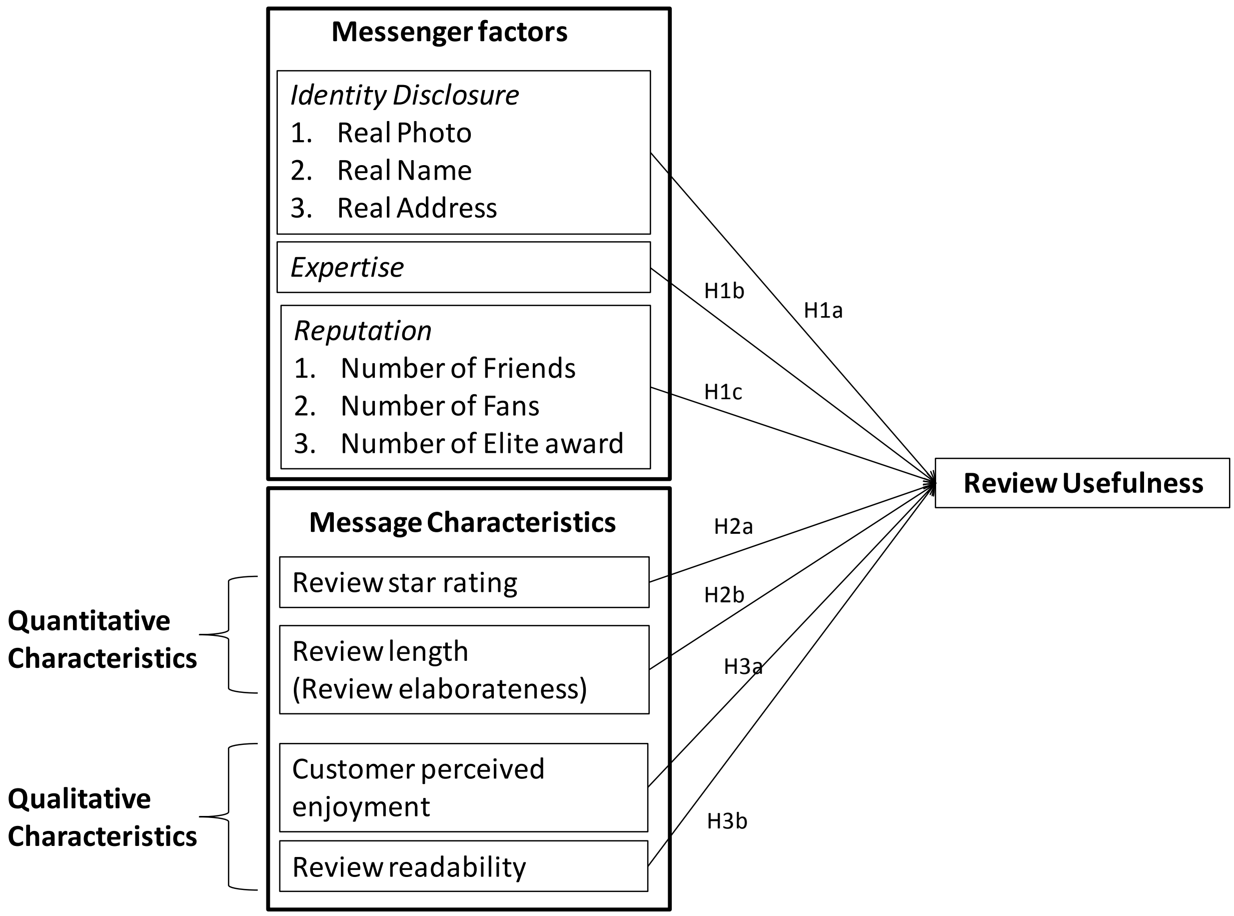

Fig. 1. The proposed research model

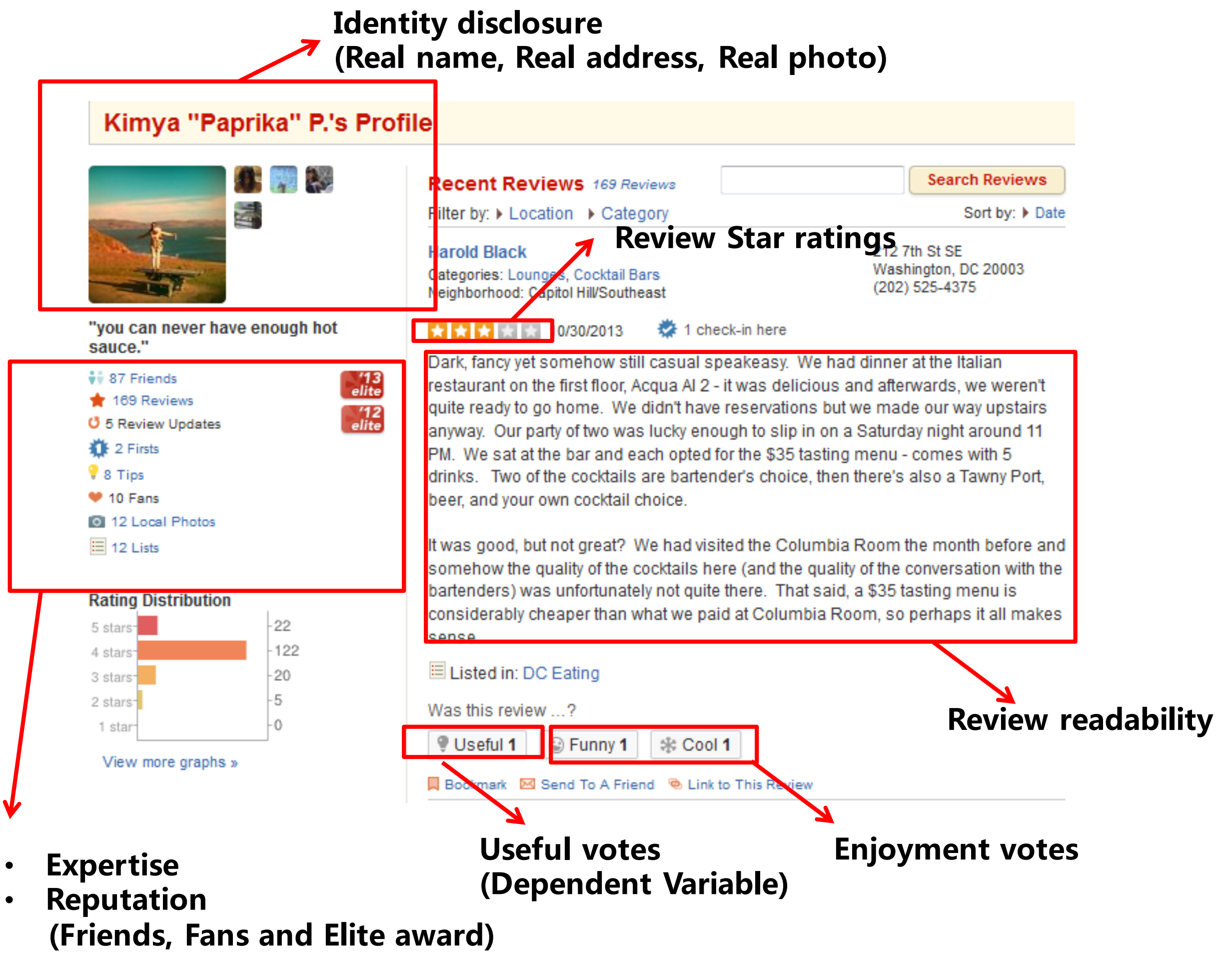

Fig. 2. Illustration of the variables in an online consumer review

Table 1
The readability tests

Readability	Score range	Formula	Measurement implications
Automated	1–12	ARI=4.71×$\left(\frac{Characters}{words}\right)$ +0.5×$\left(\frac{words}{Sentences}\right) - 21.43$	Indicates the educational grade level required. The lower the grade, the more readable the text.
Readability Index (ARI)	1-12	CLI=5.89×$\left(\frac{Characters}{words}\right) - 0.3$×$\left(\frac{Sentences}{words}\right) - 15.8$	Indicates the educational grade level required. The lower the grade, the more readable the text.
The Coleman–Liau	0-100	FRE= 206.835- 1.015×$\left(\frac{total\ words}{total\ sentences}\right)$- 84.6×$\left(\frac{total\ syllables}{total\ words}\right)$	Scores above 40% indicate that the text is understandable by literally everyone. As the value of the index decreases, the comprehensibility of the text becomes more difficult
Index (CLI)	1-12	FOG=0.4×$\left(\left(\frac{Words}{Sentences}\right) + 100 \times (\frac{N(complex\ words)}{N(words)})\right)$	Indicates the educational grade level required. The lower the grade, the more readable the text

Source: Gunning, 1969; Flesch, 1951; Kincaid et al., 1975; Coleman & Liau, 1975

Table 2

Descriptive statistics for the variables

Variable	Minimum	Maximum	Frequency	Percent
Real name	0	1	4,681	95.4%
Real photo	0	1	3,499	71.3%
Real address	0	1	4,858	99.0%
			Mean	Std.
Expertise	0	6,614	157.650	283.453
Friends	0	4,947	78.676	245.248
Fans	0	866	10.669	42.173
Elite award	0	9	1.159	1.765
Useful votes	0	5	0.865	1.203
Word count	1	965	138.424	119.527
Rating	1	5	4.275	0.873
Enjoyment votes	0	36	0.909	1.922
FOG	0.4	56.809	9.225	3.169
ARI	-9.36	84.579	6.208	3.866
CLI	-17.47	30.474	7.077	2.515
FRE	-48.38	162.505	81.623	13.048

N = 4,908

Table 3

Correlation Analysis

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	PU	1														
2	realname	0.07*	1													
3	realphoto	0.18*	0.21*	1												
4	realaddress	0.02	-0.01	0.01	1											
5	expertise	0.18*	0.09*	0.33*	0.01	1										
6	friends	0.25*	0.17*	0.48*	0.01	0.72*	1									
7	fans	0.27*	0.13*	0.40*	-0.01	0.80*	0.77*	1								
8	Eliteaward	0.22*	0.15*	0.39*	0.02	0.74*	0.71*	0.76*	1							
9	Pevotes	0.66*	0.06*	0.17*	0.03	0.20*	0.27*	0.28*	0.23*	1						
10	wordcount	0.26*	0.07*	0.17*	0.02	0.24*	0.27*	0.28*	0.26*	0.22*	1					
11	star_ratings	0.07*	0.03	-0.02	-0.02	-0.11*	-0.04*	-0.06*	-0.07*	0.09*	-0.05*	1				
12	FOG	0.07*	0.02	0.03*	-0.01	0.04*	0.02	0.06*	0.03*	0.06*	0.30*	0.01	1			
13	ARI	0.09*	0.03	0.06*	0.01	0.07*	0.06*	0.10*	0.06*	0.08*	0.35*	-0.03*	0.86*	1		
14	CLI	0.03*	0.01	0.01	0.01	-0.01	-0.01	0.02	0.01	0.01	0.13*	0.05*	0.66*	0.78*	1	
15	FRE	-0.03	-0.01	-0.02	-0.01	0.01	0.01	-0.02	0.01	-0.02	-0.11*	-0.07*	-0.78*	-0.75*	-0.79*	1

Note: **realname** refer to whether the messenger has a real name; **realphoto** refer to whether the messenger has a real photo; **realaddress** refer to whether the messenger has a real address; **expertise** refer to the numbers of prior reviews that messenger writes; **friends** refer to the numbers of friends that messenger has in Yelp.com; **fans** refer to the numbers of fans that messenger has in Yelp.com; **eliteaward** refers to how many times that messenger achieves the Elite title in Yelp.com; **wordcount** refer to the number of words in each review; **star_rating** refer to the ratings that reviewer post; **Pevotes** refer to perceived enjoyment; **FOG** refers to Gunning's FOG Index; **ARI** refers to Automated Readability Index; **CLI** refers to the Coleman-Liau Index; **FRE** refers to Flesch Reading Ease Index;

*$p<0.05$

Table 4
Results of Model 1 regression analysis

	Coefficient	Std. Err.	P value	95% Conf. Interval	
Constant	-2.6089	1.235	0.035*	-5.0302	-0.1875
realname	0.3035	0.178	0.088±	-0.0448	0.6517
realphoto	0.6629***	0.084	0.000***	0.4982	0.8276
realaddress	1.4983	1.222	0.220	-0.8976	3.8941
expertise	-0.0002	0.000	0.213	-0.001	0.0001
friends	0.0007***	0.000	0.000***	0.0003	0.0011
fans	0.0021	0.001	0.064±	-0.0001	0.0044
eliteaward	0.1846***	0.026	0.000***	0.1344	0.2347
Pseudo R^2	0.0255				

Note: Log likelihood=-6642.8095; ±Significance: p<0.1. *Significance: p<0.05. **Significance: p<0.01***Significance: p<0.001

Table 5

Results of Model 2 regression analysis

	Coefficient	Std. Err.	P value	95% Conf. Interval	
Constant	-1.6779	1.2813	0.190	-4.1899	0.8341
realname	0.2574	0.1737	0.139	-0.0832	0.5980
realphoto	0.6028	0.0823	0.000***	0.4414	0.7642
realaddress	1.3850	1.2009	0.249	-0.9693	3.7393
expertise	-0.0002	0.0002	0.201	-0.0006	0.0001
friends	0.0007	0.0002	0.001**	0.0003	0.0011
fans	0.0022	0.0011	0.053±	0.0000	0.0044
eliteaward	0.1621	0.0250	0.000***	0.1131	0.2112
star_ratings	0.3688	0.0524	0.000***	0.2660	0.4715
$rating^2$	0.1566	0.0308	0.000***	0.0960	0.2171
wordcount	0.0034	0.0003	0.000***	0.0029	0.0039
Pseudo R^2	0.0403				
ΔR^2	0.0148				

Note: Log likelihood=-6541.8392; ±Significance: $p<0.1$*Significance: $p<0.05$**Significance: $p<0.01$***Significance: $p<0.001$.

Table 6

Results of Model 3 regression analysis

	Coefficient	Std. Err.	P value	95% Conf. Interval	
Constant	-1.9891	1.1365	0.080±	-4.2171	0.2389
realname	0.1860	0.1421	0.191	-0.0926	0.4645
realphoto	0.3394	0.0676	0.000***	0.2069	0.4718
realaddress	0.7139	0.9455	0.450	-1.1398	2.5675
expertise	0.0000	0.0001	0.973	-0.0003	0.0003
friends	0.0003	0.0002	0.071±	0.0000	0.0006
fans	-0.0022	0.0009	0.021	-0.0040	-0.0003
Eliteaward	0.0933	0.0206	0.000***	0.0530	0.1337
wordaccount	0.0020	0.0002	0.000***	0.0015	0.0025
star_ratings	0.1696	0.0433	0.000***	0.0845	0.2547
$rating^2$	0.0980	0.2519	0.000***	0.0486	0.1474
PEvotes	0.5014	0.0140	0.000***	0.4740	0.5288
FOG	0.0047	0.0181	0.795	-0.0308	0.0403
ARI	0.0245	0.0143	0.086±	-0.0035	0.0524
CLI	0.0230	0.0176	0.190	-0.0114	0.0575
FRE	0.0086	0.0043	0.046*	0.0001	0.0170
Pseudo R^2	0.1289				
ΔR^2	0.1034				

Note**:** Log likelihood=-5937.6205; ±Significance: $p<0.1$*Significance: $p<0.05$**Significance: $p<0.01$***Significance: $p<0.001$

Appendix A. Collinearity Estimation

Table 7

The results of VIF and tolerance in the regression model

Variables	VIF	Tolerance
Real name	1.05	.951
Real photo	1.19	.842
Real address	1.00	.998
Expertise	2.50	.400
Friends	2.68	.373
Fans	2.51	.398
Elite award	1.96	.509
Word account	1.15	.868
Star ratings	1.95	.512
Star rating^2	1.92	.520
Enjoyment	1.14	.877
FOG	4.15	.241
ARI	4.11	.243
CLI	2.36	.423
FRE	3.54	.283

Note: conditional index places between .001 and 9.346

To assess collinarity between explanatory variables, a series of estimations used for OLS regression was conducted, including VIF, tolerance and conditional index. Since multicollinearity is an issue between independent variables, not a dependent variable, it does not depend on the link function. Accordingly, the steps applied in OLS regression are reasonable approaches in censored regression (Belsley, Kuhand, & Welsch, 1980). Table 7 presents that VIF values of each fifteen independent variable are below 10 and tolerance levels are over .10 as the cut-off points (Hair, Anderson, Tatham, & Black, 1995). Furthermore, the conditional indexes are below 30 (Belsley, et al., 1980). Thus, based on these diagnostic results, there is limited concern of collinearity between explanatory factors in the regression model.

References

Belsley, D. A., Kuhand, E., & Welsch, R. E. (1980). *Regression diagnostics.* John Wiley & Sons, New York.

Hair, J. F. Jr., Anderson, R. E., Tatham, R. L. & Black, W. C. (1995). *Multivariate Data Analysis* (3rd ed). New York: Macmillan.