ASYMMETRIC EFFECTS OF ONLINE CONSUMER REVIEWS

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ABSTRACT

Consumers tend to seek heuristic information cues to simplify the amount of information involved in tourist decisions. Accordingly, star ratings in online reviews are a critical heuristic element of the perceived evaluation of online consumer information. The objective of this article is to assess the effect of review ratings on usefulness and enjoyment. The empirical application is carried out on a sample of 5,090 reviews of 45 restaurants in London and New York. The results show that people perceive extreme ratings (positive or negative) as more useful and enjoyable than moderate ratings, giving rise to a U-shaped line, with asymmetric effects: the size of the effect of online reviews depends on whether they are positive or negative.

Keywords: online review; asymmetrical effects; heuristics; count model.

Introduction

The advent of the Internet brought about a new form of web communication (eWOM), which facilitates offering and sharing information between service providers and consumers as well as between consumers themselves. Smith (2013) stated that 60% of consumers consider ratings and reviews important when researching products. According to the Mintel report (2013), about 38% of UK travellers used consumer review websites for their holiday planning, and 86% of online travellers in the UK said online consumer reviews are a helpful information source in booking hotels. Online reviews, a type of eWOM, gain more popularity and provide influence in tourism due to the characteristics of travel products (i.e., intangibility and perishability), where people have difficulty in assessing the quality of products/services before consumption (Woodside & King, 2001). As such, travellers search for information to reduce uncertainty and perceived risks when planning their trips (Bronner & de Hoog, 2011). In this respect, online reviews of travel experiences posted on reliable websites are perceived as unbiased and trustworthy because they reduce the likelihood of later regretting a decision (Duverger, 2013) as well as allow readers to easily imagine what products look like (Yoo & Gretzel, 2008). That is, the recipients have inherent beliefs in the value of information provided by other consumers as consequences of either perceived similarities (Tussyadiah, Park & Fesenmaier, 2008) or perceived knowledge about products (Bansal & Voyer, 2000).

With recognition of the importance of eWOM, previous scholars in tourism and hospitality have mainly investigated the effect of online consumer reviews on two facets: predicting product sales (Ye, Law, Gu, & Chen, 2011) and the consumer decision making process (Vermeulen & Seegers, 2009). These studies consistently found that the characteristics of online reviews (i.e., star ratings, review richness, and valence of reviews) (Sparks & Browning, 2011) and of review providers (i.e., identity disclosure and level of expertise) (Vermeulen & Seegers, 2009) have positive influences on increasing revenues and assisting purchase decisions. However, research that attempts to identify what makes an online review helpful to consumers is limited (Mudambi & Schuff, 2010). Importantly, along with the increasing number of reviews available online, travellers can easily obtain information via the Internet (decreased search costs), whereas they find it difficult to choose specific information to help with the final decision (increased cognitive costs). Consumers, therefore, tend to seek heuristic information cues (i.e., star ratings in online reviews) to simplify the size of information involved due to their limited ability to arrive at the optimal solution, which is known as bounded rationality (Payne, Bettman, & Johnson, 1992). Thus, this article argues and relies on the importance of understanding the effect of star ratings as a vital heuristic element on the information evaluation process.

More specifically, this study analyses perceived usefulness and enjoyment to measure how consumers evaluate online reviews. Once a consumer reads an online review, he/she would choose to adopt the information to make a decision based upon two different aspects of the information process: usefulness (extrinsic motivation: the instrumental value of the information) and enjoyment (intrinsic motivation: the performance of an activity for no apparent reason other than the performance itself) (see Deci & Ryan, 1985; Moon & Kim, 2001; Sussman & Siegal, 2003). A number of researchers in marketing, information and communication technology have applied these dual motivations (perceived usefulness and enjoyment) to understand roles of search motives for predicting consumer information search behaviours (Bloch, Sherrell, & Ridgway, 1986) and to explain the assessment and adoption of information technology (Thong, Hong, & Tam, 2006).

Therefore, the aim of this research is to estimate the relationship between "consumers' review ratings" and "perceived usefulness and enjoyment of reviews". In order to address the research purpose, this study analysed over 5,000 online reviews of a type of travel products (i.e., restaurants) by controlling a number of messenger and message characteristics. The findings of this current research make several theoretical contributions to tourism literature. Previous studies showed mixed empirical results (Liu, 2006), indicating that consumer review ratings have positive (Ogut & Tas, 2012), negative (Berger, Sorensen, & Rasmussen, 2010) and quadratic influences (Duverger, 2013) on information search and consumer decision-making behaviours. In this vein, the present research sheds light on the role of review ratings in online consumers' responses to information in terms of perceived usefulness and enjoyment. As for practical implications, this article makes suggestions for tourism marketers about how to use and react to online consumer reviews when developing technological marketing strategies.

Online consumer reviews

Current consumers largely consider online consumer reviews as a form of eWOM in a decision making process to purchase products online and offline. Online reviews enable people to obtain detailed information with high trustworthiness and credibility compared to information provided by marketers. Based on the importance of online reviews, a number of researchers in marketing and information systems have concerned the characteristics of reviews and reviewers to estimate the effect of online reviews on three main aspects: product sales, consumer behaviours, and users' perceptions of information.

From the firm performance perspective, previous studies suggest that the volume of online WOM is positively associated with product sales: for example, the dispersion of consumer reviews in online communities causes the awareness effect of the product (Duan, Gu, & Whinston, 2008). Forman, Ghose and Wiesenfeld (2008) indicated the importance of information about source identity, and found that the prevalence of online reviews provided by reviewers who disclose their identity information increases product sales. Numerous scholars have investigated the effect of the valence of online reviews (or feedback); however, the findings seem to be mixed (Liu 2006). On the one hand, positive consumer reviews increase product sales, whereas negative online reviews decrease revenues (Chevalier & Mayzlin, 2006). On the other hand, online reviews are not correlated with sales (Chen, Wu, & Yoon, 2004). Liu (2006) estimated the temporal relationship between consumer comments and box office revenue on a weekly basis. The results reveal that the volume of WOM predicts better aggregate and weekly revenue, whereas the valence of WOM is not significantly correlated with revenue. Interestingly, a negative relationship is also identified in that negative online feedback leads to increasing sales (Berger, et al., 2010). The claim is that products reviewed by consumers have a greater chance of staying in consumers' consideration sets than products that have not been reviewed.

Apart from product sales, online reviews influence the consumer decision making process. When online consumers view a product listing on a shopping website, they may not have easy access to information about the 'true' quality of the product and therefore, may not be able to precisely judge product quality prior to purchase (Fung & Lee, 1999). The difference of information that sellers and buyers possess refers to information asymmetry. In the uncertain situation resulting from information asymmetry, trust is an important predictor of actual risk taking behaviour (i.e., buying from an online store). Accordingly, a series of studies conducted by Ba and Pavlou (2002), and Pavlou and Dimoka (2006) found that the quality and valence of online feedback influence the seller's trustworthiness (benevolence and credibility), which enhances price premium. Park, Lee and Han (2007) designed a set of experimental studies to show that review quality and quantity positively influence consumer purchasing decisions.

Another stream of research on online reviews assessed the evaluation of online information sources in terms of the helpfulness and usefulness of reviews (Baek, Ahn, & Choi, 2013). Mudambi and Schuff (2010) investigated review helpfulness 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 showed that review depth (elaborateness) has a positive effect on the helpfulness of reviews. Interestingly, however, they also found that reviews with extreme ratings are less helpful than reviews with moderate ratings (inverted U-shape relationship), which is different to the finding of the study of Purnawirawan, Pelsmacker, and Dens (2012) which suggested that unbalanced review sets are considered more useful than those that are balanced.

Online consumer reviews in tourism and hospitality

The nature of tourism and hospitality products (inherently experiential, intangible, and heterogeneous) makes it hard for people to estimate the quality of products before actually purchasing them. Travellers actively seek detailed and reliable information to alleviate the level of uncertainty in the decision making process. Online reviews written by other consumers allow travellers to obtain sophisticated information as well as acquire indirect experience of tourism consumption (Litvin, Goldsmithb, & Pan, 2008).

With the recognition of these benefits of online reviews, tourism scholars have estimated the effect of consumer reviews on three areas: (1) product sales, (2) travel decisions, and (3) source evaluations. With regard to product sales in tourism and hospitality, several researchers estimated the changes of market share in hotels (Duverger, 2013; Xie, Chen, & Wu, 2012) and restaurants (Zhang, Ye, Law, & Li, 2010) by considering the characteristics of online reviews. Based on the assumption that the number of reviews per room for a hotel corresponds to sales per room, Ogut and Tas (2012) assessed the effect of review scores and star ratings on not only hotel room sales but also price. The results of the study found that while hotel star ratings do not affect sales, improvement of customer rating increases the sales and price of hotel rooms. Ye, et al., (2011) investigated a hotel consumer review website and found that a 10 percent increase in travel review ratings increases online hotel bookings by more than five percent. In the restaurant context, Zhang, et al., (2010) showed that consumer-generated ratings representing the quality of food, environment and service of restaurants and volume of reviews have positive relationships with online restaurant popularity (i.e., number of page views). The study of Yacouel and Fleischer (2012) attempted to estimate the relationship between consumer review ratings and price premiums. The online reviews posted in OTAs reflecting service quality help prospective consumers trust their decisions; this increase in trustworthiness leads the travellers to pay higher price to hotel rooms.

In terms of travel decision-making, Leung, Law, van Hoof, and Buhalis (2013) suggested that online consumer-generated contents influence entire phases of the travel planning process, including pre-, during- and post-trips. For example, online reviews affect the formation of consideration sets (Vermeulen & Seegers, 2009) and purchasing intentions (Spartks & Browning, 2011) for travel products, whereby positive reviews with numerical ratings improve attitudes toward travel products and in turn, increase purchasing intentions. Filieri and McLeay (2014) used an elaboration likelihood model to identify the factors that lead to the adoption of consumer information, such as product ranking, information accuracy, value-added information, information relevance, and information timeliness.

Several tourism and hospitality researchers explored travellers' responses to online reviews, which focuses on the trustiness, helpfulness, and usefulness of reviews (Racherla & Friske, 2012; Wei, Miao, & Huang, 2013). The study of Wei, et al., (2013) revealed that positive consumer reviews enjoy more favourable evaluations than negative comments, and heuristic cues of online reviews lead readers to enlarge the perceived helpfulness of the reviews.

Perceived usefulness and enjoyment: Extrinsic and intrinsic motivation

e-WOM information is found in various forms that differ in accessibility, scope and source (Chatterjee, 2001). Due to the presence of highly accessible information with immerse volume and various sources and contents, offering more useful and effective information to consumers is a vital task for tourism and hospitality marketers. In fact, the Internet allows consumers to obtain as much information as they want (low search costs), although it makes it hard to determine helpful information (high cognitive costs). Accordingly, the way to enable readers to easily access helpful reviews is to accomplish review diagnosticity (Mudambi & Schuff, 2010) and to provide a signalling cue for users by efficiently filtering reviews (Ghose & Ipeirotis, 2011). That is, online sites with more useful reviews offer greater potential value to customers and contribute to them building confidence in purchase decisions (Gupta & Harris, 2010).

In an online environment, the concept of perceived enjoyment (or playfulness) has been regarded as an important factor that increases interactivity between online websites and users so as to improve persuasiveness (Fogg, 2003). By finding enjoyment and playfulness through accessing websites, people fully immerse themselves into the online experience and improve their search results. It has been found that not everyone who collects information has intentions to go on trips and purchase products in the short term. Rather, the information search is taken for social, entertainment, visual, and creative purposes (Vogt & Fesenmaier, 1998). Thus, understanding features of online travel websites that give enjoyment to readers is critical to satisfy travel information seekers and potentially bring about actual behaviours. The following section discusses the importance and roles of perceived usefulness and enjoyment in the context of online consumer reviews (information).

Davis and his colleagues (1989) proposed a Technology Acceptance Model (TAM) suggesting two beliefs to explain the adoption of information technology: perceived usefulness and ease of use, which directly affect behavioural intention. Substantial numbers of scholars confirm that perceived usefulness, defined as a user’s belief that using a particular system enhances his or her task performance, is the main determinant leading to user acceptance of technology across diverse disciplines (e.g., Teo, Lim & Lai, 1999). On the other hand, van der Heijden (2004) argued that considering hedonic products, the effect of perceived usefulness would not be consistent with the findings from utilitarian products. The result of the study reveals that when people use the information system at home, which is associated with the hedonic system, perceived enjoyment, defined as “the extent to which fun can be derived from using the system as such” (Van der Heijden, 2004, p.697), plays a more important role in explaining the intention to access a product website than perceived usefulness.

Researchers investigating motivation theory have consistently distinguished between two classes of motivation to perform an activity: extrinsic and intrinsic motivations (e.g., Deci, 1975; Deci & Ryan, 1985). Extrinsic motivation refers to the performance of an activity that is perceived to be instrumental in achieving the valued outcomes, whereas intrinsic motivation means the performance of an activity for no apparent reinforcement other than the process of performing the activity per se. Perceived usefulness is associated with extrinsic motivation, and perceived enjoyment is related to intrinsic motivation (Davis, Bagozzi, & Warshaw, 1992). In other words, extrinsic motivation relates to goal-driven reasons that indicate benefits and/or rewards reinforcing the value of outcomes through actions, whereas intrinsic motivation refers to the pleasure and inherent satisfaction obtained from the activity for its own sake (Ryan & Deci, 2000). Built on the study of Davis et al., (1992), a number of previous scholars presented the consistent results that both extrinsic (perceived usefulness) and intrinsic motivation (perceived enjoyment) are influential predictors to explain Internet usage (Teo et al., 1999), online shopping (Shang, Chen & Shen, 2005), acceptance of technology (Moon & Kim, 2001), computer use in the workplace (Fagan, Neill, & Wooldridge, 2008), and social communication systems (Dickinger, Armi, & Meyer, 2008).

Valence of online reviews

Forman et al., (2008) demonstrated that when people face an overload of information in the form of numerous online reviews, they process information heuristically, which relies on source characteristics and/or pictorial review ratings as a convenient and efficient heuristic device. Online consumers who face large number of reviews are likely to consider the valence of consumer product reviews, which serve as a proxy for underlying product quality (Chaiken & Maheswaran, 1994). This tendency is especially apparent for experiential and credential products. Thus, the present research focuses on online review ratings (star ratings) as one of the main heuristic cues to estimate their relationship with two types of user responses to online information, i.e., perceived effectiveness and enjoyment.

The relationship between the valence of online reviews and perceived usefulness

The valence of online reviews refers to the evaluative direction of the review on experiences in purchasing products. That is, the star ratings are a reflection of attitude extremity, which is the deviation from the midpoint of an attitude scale (Krosnick, et al., 1993). Given the notion of review ratings, the present study argues that a one-sided response, which entails the apparent direction of a consumer's views, triggers relatively more diagnosticity than a moderate review (Mudambi & Schuff, 2010). The accessibility-diagnosticity model suggests that a piece of information can be perceived as diagnostic when it helps consumers place a product on the list of cognitive category for further consideration (Feldman & Lynch, 1988). Contrarily, comments that include ambiguous viewpoints may not be referred to as diagnostic and cannot assist consumers in reducing the number of alternative product choices (Herr, Kardes, & Kim, 1991). To be more specific, Forman et al., (2008) found that moderate ratings (around three stars) were considered less helpful compared to extreme ratings (one star/five stars). This implies that consumers perceive one-sided reviews as more helpful than balanced reviews that report both positive and negative aspects. Pavlou and Dimoka (2006) also demonstrated the consistent findings that extremely positive or negative ratings of online sellers were assessed as more informative than moderate ratings.

Thus, online consumer reviews that indicate the direction of attitudes toward the products (vividness, referring to accessibility) by describing the acceptable reasons (diagnosticity) are more useful than cues which are vague (Ahluwalia & Gurhan-Canli, 2000). With regard to information asymmetry, positive and negative reviews that provide strength and weakness of the products/services enhance the completeness of information and ultimately reduce the level of information asymmetry (Cheung, Lee, & Rabjohn, 2008). As a result, the reader may have more confidence that the information is true, in a way that positive and negative reviews are perceived to be more useful than neutral reviews (Purnawirawan, et al., 2012).

Comparing between positive and negative reviews, in general, consumers perceive extremely negative reviews as less ambiguous than positive cues, especially in product-judgment contexts (Maheswaran & Sternthal, 1990). According to the prospect theory (Kahneman & Tversky, 1979), people appear to give higher value to the experience of loss than to that of the pleasure associated with gaining an amount equivalent to that which was lost, because the value function is steeper for losses than for gains. In other words, the choice between two alternatives is more influenced by potential loss associated with each alternative than potential gain (Puto 1987; Thaler 1985). This argument is consistent with the notion of negativity bias, which refers to the tendency for a unit of activation to bring about a greater change in output by the negative motivational system compared with the positive motivational system (Cacioppo, Gardner, & Berntson, 1997). Accordingly, a negative input has a greater effect on attitudinal and behavioural expressions than a positive input (Cacioppo & Bernston, 1994). From the information process perspective, it can also be argued that negative information has stronger influences on individual's judgement and choice than positive information (Skowronski & Carlston, 1989). Ito, Larsen, Smith and Cacioppo (1998) identified that the negative bias largely occurs at the stage of information and choice evaluation. Thus, negative online reviews could be more attention grabbing in general and receive greater scrutiny, thus being more useful (Homer & Yoon, 1992), and ultimately have a stronger effect on customers' evaluations than positive messages.

The relationship between the valence of online reviews and perceived enjoyment

Yoo and Gretzel (2008) argued that enjoyment is one of main motivations for travellers to write their travel comments, based upon the hedonic perspective that understands travellers as pleasure seekers engaged in activities for enjoyment and entertainment. That is, online travellers are more likely to pursue the reviews that not only provide useful information for decision-making but also give them enjoyment and fun when reading other travellers' experiences. Tussyadiah, et al. (2011) stated that according to the concept of mental simulation and narrative transportation (Escalas, 2004), consumer reviews that encompass identification of resemblance to past experience and of story characters are more influential in terms of increasing readers' knowledge and intention to purchase travel products than those that encompass functional information of travel experiences. Mental simulation and consumption visions can only be formed when people are more inclined to read reviews while performing non self-referencing narrative processing (i.e., reading reviews written by other travellers), leading to future self-referencing imagery (i.e., imaging self-experiences of purchasing the same products). That is, positive and negative reviews that reflect the specific reasons and experiences of products consumed enable audiences to enjoy themselves as they resemble the stories stored in their memories. Thereby, review ratings which indicate either extremely positive or negative responses are more enjoyable than neutral evaluations.

Evaluating between positive and negative ratings of reviews with perceived enjoyment, cognitive evaluation theory states that feelings of competence (positive imagery) when reading positive reviews (supportive information) can catalyse intrinsic motivation (i.e., perceived enjoyment), which brings about a willingness to have the same experiences because the basic human needs for competence are being satisfied (Ryan & Deci, 2000). The underlying assumption of adaptive behaviour is that decision makers who have a limited capacity of information process focus on the accuracy of decision and the amount of cognitive effort required to make decisions, and the selection of the information evaluation strategy is regarded as a function of both the costs (efforts) required and the benefits (ability) of a strategy to select the best alternative (Payne et al., 1992). For example, consumers systematically prefer information that is consistent with their beliefs, attitudes or decisions and, in contrast, overlook inconsistent information: selective exposure to (consistent) information (Fischer, Schulz-Hardt & Frey, 2008). This pattern can be identified in the online environment in that online travellers who seek and read comments for a certain product may have preferences and 'somehow' have the intention to purchase the product. When these people identify the high- review scores given to the product considered, they feel conformity and are internally motivated to purchasing behaviour as if they were to perceive positive reviews as more enjoyable than negative reviews (Nascu & Zinkhan, 1999).

[Insert Figure 1 here]

Research design

Method

The method applied to examine the effect of online reviews (star ratings) on usefulness and enjoyment is based on the estimation of count models. The most well-known approximation is derived from the Poisson distribution $P(\lambda)$, where λ is the average of the random variable, which, in this case, is the number of "useful" or "enjoyment" votes awarded to the review in a certain period of time. However, this model is based on the assumption of mean-variance equality, which is too restrictive to represent individual behaviour as it cannot consider the heterogeneity of these individuals and creates what is known as the *"problem of over-dispersion"* (Gurmu & Trivedi, 1996). As an alternative, our study proposes the use of a count model based on a Negative Binomial distribution (Cameron & Trivedi, 1998) in order to ease the restrictions of the Poisson modelling. Following the general formulation of the Negative Binomial model, the probability of an online review t receiving a number y_t of "useful" or "enjoyment" votes is given by the expression:

$$P(y_t) = \frac{\Gamma(\alpha^{-1} + y_t)}{\Gamma(\alpha^{-1})\Gamma(y_t + 1)} \left(\frac{\alpha^{-1}}{\alpha^{-1} + e^{\sum_{k=1}^{K} \beta_k x_{tk}}} \right)^{\alpha^{-1}} \left(\frac{e^{\sum_{k=1}^{K} \beta_k x_{tk}}}{\alpha^{-1} + e^{\sum_{k=1}^{K} \beta_k x_{tk}}} \right)^{y_t} \quad \forall y_t = \{0,1,2,...\}$$

where Γ represents the Gamma function, x_{tk} the characteristic k of online review t and β_k the parameter which indicates the effect of x_{tk} on $P(y_t)$. The parameter α covers the dispersion of the observations, in such a way that

$$E(y_t) = e^{\sum_{k=1}^{K} \beta_k x_{tk}} = \lambda_t$$

and

$$V(y_t) = e^{\sum_{k=1}^{K} \beta_k x_{tk}} + \alpha \cdot e^{2\sum_{k=1}^{K} \beta_k x_{tk}} = \lambda_t + \alpha \cdot \lambda_t^2 .$$

One way of verifying the validity of the Negative Binomial model as opposed to the Poisson model consists of testing the null hypothesis α=0 with a t test. Note that its acceptance would imply that $E(y_t)=V(y_t)$, so that the Poisson model is a particular case of the Negative Binomial when α=0 (Gurmu & Trivedi, 1996).

This approximation overcomes the bias problems of the regression analysis arising from the discrete character of the dependent variable (Hellerstein & Mendelsohn, 1993) and the inefficiency problems of the Multinomial Logit Model (Cameron & Trivedi, 1998). Note that the Multinomial Logit Model has serious disadvantages as a consequence of the consideration of a high number of alternatives (0,1,2,3,...”useful” votes), which impedes the attainment of efficient estimations. In fact, Cameron and Trivedi (1998) indicate that alternatives which are rarely chosen should be aggregated in order to obtain an efficient estimation of the Multinomial Logit. Also, note that this model “naturally” incorporates the presence of the zero value, so the non-existence of votes is inherently considered in the estimation.

Research sampling

This research collects data on online consumer reviews from Yelp.com, which constitutes the majority of consumer feedback on restaurants on the website (Luca, 2011). The survey finding of Nielson reports that when searching for information about restaurants, Yelp is the most frequently visited websites cited by consumers nearly 3 times as often as OpenTable and almost 4 times as often as Zagat (Yelp.com, 2014). The logic behind focusing on restaurants is that the choice of restaurant is an important travel activity and it includes the notion of experiential goods, where it is difficult for consumers to judge the quality of services/products before purchasing. Thus, consumers are more likely to rely on signals (useful and entertainment votes) to evaluate these credence attributes and share their experiences with other consumers.

The researchers of this study collected restaurant reviews from two leading tourism markets (i.e., London and New York) to avoid a potential geographical effect on the results: specifically, 35 restaurants in London with 2,500 reviews and 10 restaurants in New York with 2,590 reviews. Tourism Alliance (2013) provided UK Tourism Statistics presenting that food and beverage serving services in the sector of UK tourism spending includes £27,358 million, the largest proportion in tourism expenditure. Similarly, the research report by NYC & Company (2013) indicates that New York City is the fastest-growing industry in leisure and hospitality in last six years (+27.4%). Specifically, destination visitors to New York City have spent on restaurants about $7.4 billion which is the second highest expenditure. Apart from the market size of tourism, these two cities are also listed on Yelp's top 100 places to eat in each country (Yelp, 2014). These statistics indicate that the two selected cities encompass a large demand and supply of the restaurant sector; therefore, the findings should be reached with a restricted bias, which is a relevant strength toward the specific setting of this research.

In addition to the location of the restaurants, the price of the restaurant products ranges from budget to luxury, according to the classification of price groups assigned by the online consumer review website. Previous studies also suggest that the level of brand familiarity of a certain product/service has an influence on information search and evaluation (Gursoy & McCleary, 2004). Thus, the restaurants selected in this research did not include national and regional chains, instead taking local restaurants as valid samples. Racherla and Friske (2012) found that a restaurant's position in the website has an influence on users' perception as more attention is drawn to businesses listed in the top places. Thus, this study approaches the collection process in a random manner rather than using either high/low rankings or alphabetical order. Specifically, the researchers collected the individual reviews of each business after randomizing the order of the business listings in each region (Hu et al., 2008; Racherla & Friske, 2012; Zhang et al., 2010).

Operationalization of variables

This study extracted all the information used for the data analysis from the online travel consumer review website, as summarized in Table 1. One of the dependent variables, online review usefulness, was measured by counting the number of online users who voted that the reviews were useful in response to the posted reviews (Ghose & Ipeirotis, 2011). The percentage of the number of votes divided by number of reviews for usefulness is 48.23% (there were 2635 reviews out of 5090 without votes). Another dependent variable is perceived enjoyment and was found by counting the number of clicks from readers who think that the review is pleasurable (Van der Heijden, 2003). The percentage of the number of votes divided by number of reviews for enjoyment is 33.69% (there were 3375 reviews out of 5090 without votes). The star ratings that judge the quality of products and services using five star levels are considered an independent variable (Chevalier & Mayzlin, 2006; Mudambi & Schuff, 2010; Racherla & Friske, 2012). Given the star rating variable, the method of dividing it into two categorized variables (i.e., positive and negative reviews) was performed, with positive reviews consisting of four and five stars and negative reviews composing one and two stars. To more specifically investigate the relative influence of reviews on two types of consumer responses (i.e., perceived usefulness and enjoyment), the researcher generated binary types of variables with medium rating ('3') as a reference group.

This current study takes into account several control variables: identity disclosure (the presence of real names and photos), level of reviewer expertise and reputation, review elaborateness, and readability.

<u>Identity disclosure</u>: Online identity refers to a social identity that an individual establishes in online communities and/or websites. Precise information of message providers can make salient contributions to recipient perception of the message (Forman, et al., 2008). That is, source (review providers) identity decreases customers' uncertainty that may arise from the limited social cues in the online environment (Tidwell & Walther 2002). This current research estimates identity disclosure in terms of messengers' names and real photos, based upon a binary approach: "1" if they disclose information and "0" otherwise.

Reviewer expertise: When people collect information for the decision-making process, they tend to incline towards experts' suggestions because they believe that information provided by an expert is more useful and trustworthy (Lascu, Bearden, & Rose, 1995). In the online environment, a proxy representing the degree of expertise on the specific interests has an influence on online readers' perceptions (Chen, Dhanasobhon, & Smith, 2008). Thus, this study examines the number of reviews that messengers have written to measure the level of expertise.

Reviewer reputation: Reputation denotes the extent to which recipients believe a reviewer is honest, concerned for others and consistent in the long-term. Gruen, Osmonbekov, and Czaplewski (2006) stated that reputation and peer recognition improve the degree to which information sharing influences the value of the product and likelihood of recommending the product. This research checked the number of Elite awards from Yelp.com.

Review elaborateness: Review elaborateness reflects the extensiveness/depth of online reviews (Shelat & Egger, 2002). It is found that longer reviews include more detailed product information about methods and places products have been purchased. Thus, this study calculates the number of words in each review to measure review elaborateness.

Review readability: Readability indicates the extent to which an individual understands and comprehends the product information, which leads to customers accepting information (Zakaluk & Samuels, 1988). To test the level of understandability of a review, this research examined Automated Readability Index (ARI) considering the number of words and characters to evaluate the understandability of a text: the ratio representing word difficulty (number of letters per word) and sentence difficulty (number of words per sentence) (Korfiatis, Garcia-Bariocanal, & Sanchez-Alonso, 2012). The value of ARI generates an estimated representation of the degree to which the text is understandable. That is, the estimated value of ARI indicates the educational grade level required to understand the textual information analysed. For example, if the ARI output is 10, high school students (age between 15-16 years old) are able to understand the text:

$$ARI = 4.71 \times \left(\frac{Characters}{Words} \right) + 0.5 \times \left(\frac{Words}{Sentences} \right) - 21.43$$

where characters refers to the number of letters, numbers, and punctuation marks; words refers to the number of spaces; and sentences refers to the number of sentences.

[Insert Table 1 here]

Results

Table 2 shows the descriptive statistics of the sample. The mean review rating is 4.28 and 95.5% and 71.9% of people reveal their identity through real names and photos, respectively. They have written 173 reviews, have won 1.2 Elite awards, and the average length of each review is 144 words.

[Insert Table 2 here]

Table 3 presents the results of the effect of online reviews. It is important to highlight first that all the models show globally significant results ($p < 0.01$) through the likelihood ratio. As for the explanatory power of the models, note that, while Hensher and Johnson (1981) claim that explaining around 15% of variance in the context of probabilistic models is acceptable, it is imperative to recognise that percentage figures like these must be regarded as a shortcoming at this stage in model evolution. Accordingly, in the next section, several ways in which the models could be improved in terms of explanatory power in future studies are proposed.

Also, Train (2011) goes even further and stresses the fact that deterministic measures should not be used in these types of models; rather, probabilistic indicators should be employed. Accordingly, the Likelihood Ratio Index has been estimated for each model to better reflect their explanatory power. The Likelihood Ratio Index, defined as [1-(Log-likelihood($\hat{\beta}$)/Log-likelihood(0))], measures how well the model, with its estimated parameters ($\hat{\beta}$), performs compared with a model in which all the parameters are zero. The comparison is made through their likelihood functions. Values around 30% are obtained which are considered to be relatively good to depict some evidence of explanatory power.

However, more relevant to this study is the fact that the parameter α is significant at 1% ($p < 0.001$) in all cases. The main implication of this is the invalidation of the basic assumption of mean-variance equality of the Poisson models, which favours the use of the Negative Binomial model (Cameron & Trivedi, 1998). In other words, it shows the existence of heterogeneity of tourist preferences, which implies the use of a model that allows for its inclusion in order to avoid possible biases in the estimations (Gurmu & Trivedi, 1996).

As for the parameter estimates, we first test the U-shaped relationship. Equations U1 and E1 show negative and significant parameters for the variable "reviews" and positive and significant parameters for the variable "squared reviews" for the two dependent variables used "usefulness" and "enjoyment". These results confirm the U-shaped relationship as shown in Figure 2, indicating that people perceive extreme ratings (positive or negative) as more useful and enjoyable than moderate ratings, in line with Forman et al. (2008); thus, favouring the idea that online consumers perceive that positive and negative reviews are more useful and enjoyable than neutral reviews.

Nevertheless, as the relevant analysis revolves around the idea that the effects of online reviews can be asymmetric (i.e. positive and negative reviews can have different impacts), the star rating variables are decomposed into positive (4 & 5) and negative reviews (1 & 2), whose results are presented in equations U2 and E2. In equation U2 we find a significant and positive parameter for negative reviews (not for positive reviews), which means that the former are considered to be more useful than the latter, in line with Basuroy et al. (2003), and Chevelier and Mayzlin (2006). Interestingly, this expectation is reversed for enjoyment (equation E2), where negative reviews are not significant and positive reviews are significantly positive, so positive reviews are associated with higher enjoyment, in line with Fischer et al. (2008).

In order to further refine the analysis, and to disentangle the levels that cause these asymmetries in the effects of positive and negative reviews, we use the star ratings themselves as independent variables. Equation U3 shows that the most negative review (star rating of 1) is the most useful, and the most positive review (star rating of 5) has a similar impact to the second-to-last most negative review (star rating of 2). Actually, the star rating of 4 is tantamount to the reference variable (star rating of 3), which in turn is the neutral variable. In fact, the star rating of 4 is marginally significant at 10% with a negative sign, meaning that its contribution to usefulness is similar or even lower than the neutral star rating of 3. Equation E3 presents a different pattern of the asymmetric effects of online reviews on enjoyment: in line with equation E2, the more positive the review, the more enjoyable it is considered to be. Actually, negative reviews (star ratings of 1 and 2) are not significant.

Also, note that these three alternative ways to approach the inclusion of the star rating variable into the model facilitate identification of the intricacies of different particular effects as well as confirmation -when applicable- of robustness, especially on account of the fact that the scores of this variable are highly skewed (mean: 4.28; standard deviation: 0.88). Therefore, examining the variable itself could lead to misleading results because the mean value could not reflect the whole range of its effect; thus, its decomposition into two (1 & 2 vs 4 & 5) and four groups (1 vs 2 vs 4 vs 5) would permit the detection of different effects for the various combinations of categories. For example, the finding that extreme ratings (positive or negative) as more useful and enjoyable than moderate ratings is unambiguously found in the star rating and squared star rating model only.

As for the control variables, we find consistent results in all six equations, where “real photo”, “expertise”, “elite award”, “word count” and “ARI index” are significant and positive. The effect of real photo on usefulness is justified by the idea that it helps increase the credibility of the information, in line with Sussman and Siegal (2003) and Kruglanski et al. (2006). Note, however, that this effect is only significant when the reviewers’ identities are disclosed through their real photos but not through their real names (this variable “real name” is not significant). With tourism being formed mainly by intangible elements, the credibility of these elements seems to be reinforced when a tangible element (a photo) is displayed in the review. This positive effect also holds for enjoyment: it seems that tangible elements not only enhance trustworthiness but also make the review more appealing.

Regarding “expertise”, the positive effect found is in line with Cheng et al. (2008), who relate higher expertise with a higher perception of usefulness. Also, it seems that expert reviewers tend to produce fun reviews, in line with Jeppesen and Frederiksen (2006). The positive effect of the “Elite award” on usefulness is in line with the idea that the reviewer’s reputation helps consumers reduce potential uncertainty when gathering information (Helm & Mark, 2007). Additionally, the positive effect on enjoyment can be derived from the greater effort that reputable reviewers make to provide interesting reviews on the websites (Jeppesen & Frederiksen, 2006).

Concerning the length of review, the variable “word count” shows a positive and significant parameter, which means that the longer the review, the more useful and enjoyable it is. These results are in line with Mudambi & Schuff (2010), who find that fine-grained reviews can provide more details about the product, thus enriching the information. Finally, the ARI variable has a significant and positive effect, so the more understandable the text, the more useful the review is, in line with Korfiati et al. (2012).

[Insert Table 3 and Figure 2 here]

Conclusions

Online reviews give a company access to immediate assessments of its customers' evaluations, and offer strong predictors of tourists' adoption of information (Filieri & McLeay, 2014). Within the e-WOM strategy, review ratings represent an attempt to quantify service quality perceptions which are determinant for customer satisfaction and behavioural intentions (Parasuraman, Zeithaml, & Malhotra, 2005). This article analyses potential asymmetries in the effect of online reviews on usefulness and enjoyment, by examining a sample of 5,090 reviews on 45 restaurants in London and New York.

The results show that people perceive extreme ratings (positive or negative) as more useful and enjoyable than moderate ratings, giving rise to a U-shaped line. Focusing on the results of interest, however, some nuances appear to qualify this result as we find that negative reviews are more useful than positive ones, but positive reviews are associated with higher enjoyment. This outcome, along with the positive effects of "real photo", "expertise", "elite award", "word count" and "ARI index" on usefulness and/or enjoyment, have relevant theoretical and practical implications.

Regarding the theoretical implications, while there are a number of studies that estimate the effect of online reviews on both consumer purchasing behaviours and product sales, the question "what make reviewers useful and joyful?" has still a long way to go. To the best of the authors' knowledge, this is the first empirical study to investigate the role of consumer ratings in the evaluative stage of online information process, and to identify the asymmetric effects according to different responses (i.e., usefulness and enjoyment) to the information considered. The findings of this research base on the theory of information diagnosticity which refers to the extent to which a consumer believes the product information is helpful to understand and evaluate purchase alternatives (Herr, et al., 1991). Consumers pay greater attention to directional reviews (i.e., positive and negative ratings) to understand the expected advantages and disadvantages derived from the consumption.

In particular, online consumers tend to focus on negative reviews in order to reduce the risk of loss more than enhancing the gain (Kahneman & Tversky, 1979). This strongly supports the notion of negativity bias arguing that rational consumers recognize the purchasing bias, and they compensate for this bias by taking negative reviews more seriously and discounting the positive reviews (Hu, Pavlou & Zhang, 2007). From the enjoyment aspect, the concept of hedonic consumption with regard to information search process suggests that consumers are likely to consider the excitement and pleasure that accompany purchase (Vogt & Fesenmaier, 1998), which supports the higher influence of positive reviews on inducing perceived enjoyment than negative reviews. Thus, this research sheds light on asymmetric effects of online review as an important information cue on different aspects of information evaluation.

The asymmetrical effects found lead to considering asymmetries when modelling the impact of online reviews. As shown in previous literature, rather than just looking at it from a linear point of view, nonlinearities can be a source of potential new information; however, beyond these nonlinearities it is relevant to find the different effects (in magnitude) of positive and negative online reviews. Also, the use of the Negative Binomial model not only invalidates the assumption of mean-variance equality but, more importantly, it shows the existence of heterogeneity of tourist preferences, which implies the use of a model that allows for its inclusion in order to avoid possible biases in the estimations.

Concerning the practical implications, as the effects of online reviews seem to behave asymmetrically, managers should recognize that measures implemented to take advantage of positive reviews and the actions developed to defend the firm from negative reviews should weigh differently. While positive reviews favour people’s enjoyment they make little impact on usefulness (unless they are extreme). Note that even in the extreme positive rating, the impact of the review on usefulness is always lower than any of the negative ratings. Therefore, though surveillance of reviews is an obvious course of action, the importance given to the ratings could depend on their sign and magnitude. Additionally, it is important to recognize that when online reviews are not helpful for consumers to make an online purchase decision, individuals would not be likely to revisit the website. Thus, given the understandings of the different roles of review ratings, the strategy that tourism marketers through which they respond to consumer reviews should be consider time and contents. For example, (1) promptness in the firm's response can be different contingent on the specific rating and (2) the emphasis of the response contents should be customized depending on different review scores.

Also, on account of the intangibility of tourism products, credibility is an essential point to be considered. According to the results obtained, this credibility is only really reached through the reviewers' photos -not just with their real names-. Note that this enhancement in credibility has to be considered in terms of both usefulness and enjoyment. In line with the uncertainty derived from intangibility, comments from "expert" and "reputable" reviewers seem to be perceived as more useful and more enjoyable, so emphasis should be placed on them when firms attempt to stress the content of specific reviews.

As for future avenues of research, confirmation of these asymmetrical impacts of online reviews would be fundamental to other tourism sectors such as hotels, travel agencies and airlines. In this way, inter-sectorial comparisons could offer further insights on the nature of the asymmetrical effects of online reviews. Also, in order to improve the models in terms of explanatory power in future studies, some relevant information (not available in this article) could be tested. Accordingly, three items should be considered: first, the existence of images of the products themselves is a relevant variable. Visual information is crucial in eWOM, and probably impacts both the perceived usefulness and enjoyment. Future research should include photos (e.g. of the restaurants and food) in the analyses. Second, tourists' perception of prices can shed some light on the formation of perceived usefulness and enjoyment. As information asymmetries play a crucial role in people's decisions, the uncertainty inherent in the purchase and consumption of tourism services makes the strategies developed to reduce information asymmetries critical; hence, to reduce the uncertainty derived from the characteristics of this experience good, an individual may rely on prices. In fact, in line with Assael (1995), people's interest and level of involvement in a product determine the extent they meaningfully absorb the information on prices; clearly, this statement strongly applies to tourism consumption in which individuals are actively involved. Finally, the third dimension to be introduced is the responsiveness of managers interacting in the reviews of their own firms. The fact that firms actively respond to online comments is regarded by tourists as a sign of the firm's involvement in consumer satisfaction, the individual's assessment of this involvement can be a good predictor of their perceived usefulness and enjoyment.

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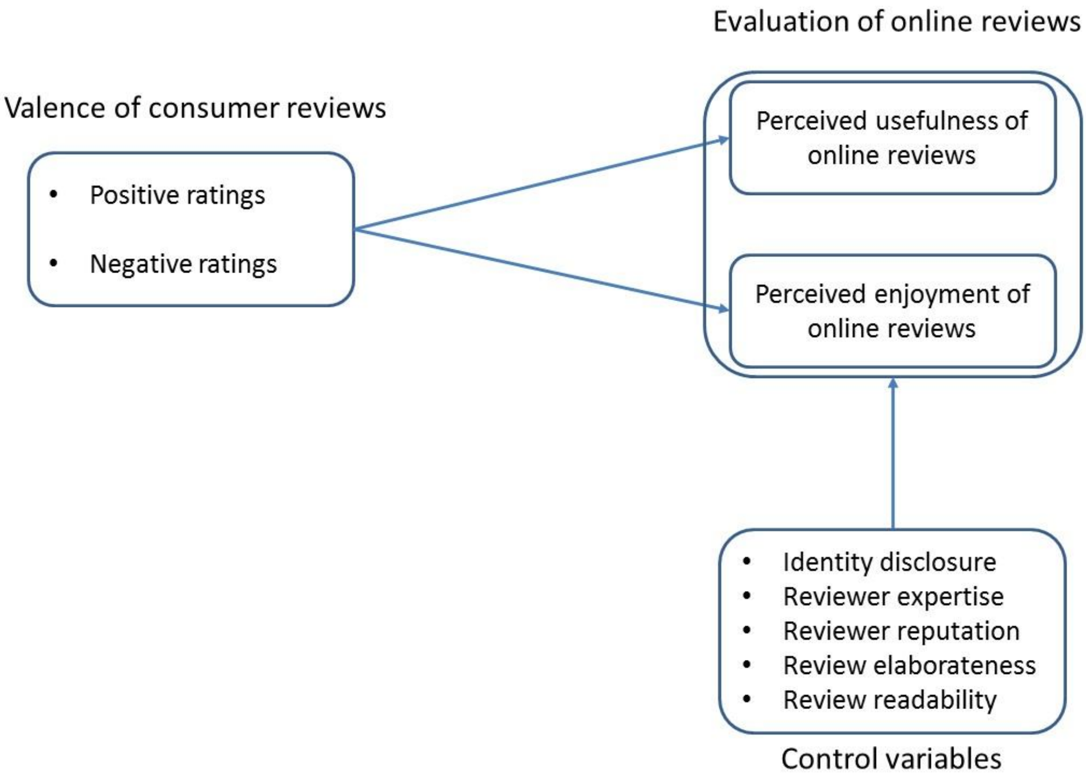

Fig. 1. The proposed model

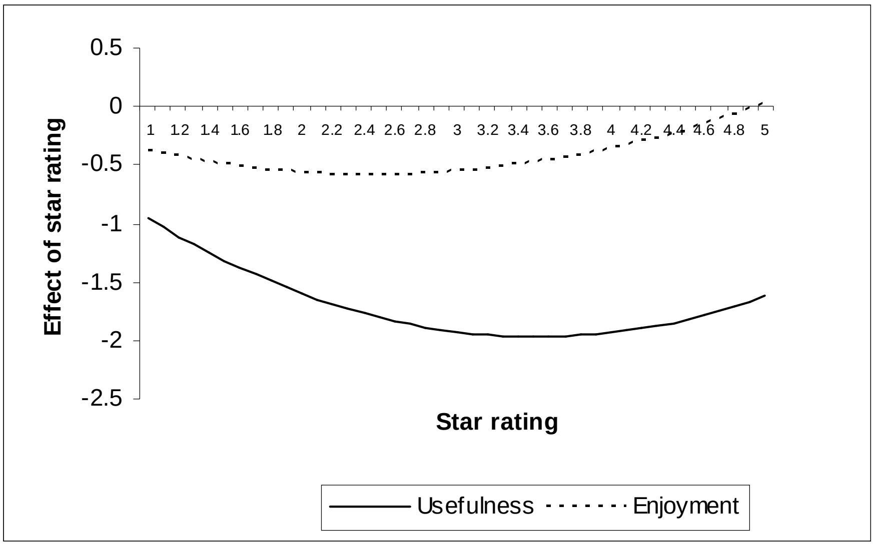

Fig. 2. The U-shaped effect of online reviews on usefulness and enjoyment

Table 1
Summary of variables and data description

Variable Names	Description	Authors
Dependent variables		
Perceived usefulness	The number of "useful" votes awarded to the review.	Mudamni & Schuff (2010)
Perceived enjoyment	The number of "funny" votes that were given to the review.	Van der Heijden (2003)
Independent variable		
Valence of review (review ratings)	The ratings that the reviewers offered within a 5-point scale	Chevalier & Mayzlin (2006)
Control variable		
Identity disclosure	The presence of real names in Yelp.com denotes "1"; otherwise "0." The presence of real photos in Yelp.com denotes "1"; otherwise "0.	Forman et al. (2008)
Reviewer's expertise	The number of previous reviews written by a reviewer	Weiss et al. (2008)
Reviewer's reputation	The number of times that each reviewer achieved the Elite title	Racherla & Friske (2012)
Review elaborateness	The number of words in each review content	
Review readability	The understandability of the consumer reviews posted	Korfiatis et al. (2008; 2012)

Table 2
Descriptive statistics

	Percentage	
Real name	95.5%	
Real Photo	71.9%	
	Mean	**Standard Deviation**
Review rating	4.28	0.880
Expertise	173.4	325.7
Elite award	1.23	1.8
Word count	143.9	125.9
ARI	6.2	3.8

Table 3
Effect of star ratings on usefulness and enjoyment

	Usefulness			Enjoyment		
	Equation U1	**Equation U2**	**Equation U3**	**Equation E1**	**Equation E2**	**Equation E3**
Reviews	-1.1163[a]			-0.4724[b]		
	(0.1393)			(0.1952)		
Squared Reviews	0.1583[a]			0.0955[a]		
	(0.0188)			(0.0258)		
Positive reviews (4 & 5)		0.0774			0.4632[a]	
		(0.0709)			(0.0945)	
Negative reviews (1 & 2)		0.3953[a]			0.1165	
		(0.1113)			(0.1542)	
Positive review (5)			0.2156[a]			0.6136[a]
			(0.0725)			(0.0964)
Positive review (4)			-0.1466[c]			0.2215[b]
			(0.0758)			(0.1001)
Negative review (2)			0.2650[b]			0.1503
			(0.1228)			(0.1663)
Negative review (1)			0.7277[a]			0.0227
			(0.1781)			(0.2842)
Real name	0.1275	0.0973	0.1171	0.2549	0.2665	0.2518
	(0.1159)	(0.1150)	(0.1159)	(0.1600)	(0.1602)	(0.1599)
Real Photo	0.3571[a]	0.3558[a]	0.3592[a]	0.4968[a]	0.4928[a]	0.4968[a]
	(0.0535)	(0.0538)	(0.0535)	(0.0694)	(0.0696)	(0.0693)
Reviewer's Expertise	0.3081[a]	0.3046[a]	0.3163[a]	0.3768[a]	0.3657[a]	0.3840[a]
	(0.0721)	(0.0731)	(0.0722)	(0.0879)	(0.0892)	(0.0883)
Reviewer's reputation	0.1272[a]	0.1210[a]	0.1263[a]	0.1848[a]	0.1808[a]	0.1823[a]
	(0.0144)	(0.0145)	(0.0144)	(0.0173)	(0.0175)	(0.0174)
Review elaborateness	0.0029[a]	0.0030[a]	0.0029[a]	0.0028[a]	0.0029[a]	0.0028[a]
	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)
Readability (ARI)	0.0127[b]	0.0123[b]	0.0132[b]	0.0033	0.0019	0.0036
	(0.0054)	(0.0055)	(0.0054)	(0.0066)	(0.0067)	(0.0066)
Constant	0.6378[b]	-1.1589[a]	-1.1818[a]	-1.7132[a]	-2.2997[a]	-2.2958[a]
	(0.2659)	(0.1345)	(0.1346)	(0.3863)	(0.1856)	(0.1850)
α	0.1550[a]	0.1903[a]	0.1522[a]	0.5204[a]	0.5546[a]	0.5180[a]
	(0.0428)	(0.0422)	(0.0429)	(0.0498)	(0.0492)	(0.0499)
R-squared	0.2176	0.1971	0.2192	0.1745	0.1529	0.1766
LR Index	0.3001	0.2971	0.3003	0.3153	0.3125	0.3154
LR statistic	6099.7[a]	6039.3[a]	6104.2[a]	4954.4[a]	4910.3[a]	4955.9[a]
Log likelihood	-7110.6	-7140.8	-7108.3	-5378.3	-5400.4	-5377.6
AIC	2.7989	2.8108	2.7988	2.1184	2.1271	2.1189
SIC	2.8118	2.8236	2.8143	2.1313	2.1400	2.1344

a=prob<0.01; b=prob<0.05%; c=prob<0.10%.