Antecedents and Consequents of Information Usefulness in User-generated Online Reviews: A Multi-group Moderation Analysis of Review Valence

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Abstract:

Online reviews have become a critical component of consumers' Web-based search queries and help them minimize uncertainty and risk associated with purchase decisions. Not only do customers perceive online reviews to be more "real", but also online reviews enable opportunities for interactivity between consumers, which makes them a popular source of information when consumers make (online) purchase decisions. In this study, we examine the impact of online reviews on consumers' beliefs, brand attitudes, and purchase intention by theoretically extending the information adoption model (IAM) with constructs from consumer research. To do so, we used data from a scenario-based online experiment and manipulated three review characteristics (currency, accuracy, and credibility) using carefully selected TripAdvisor reviews. Using a partial-least squares approach (PLS) to structural equation model (SEM), we found strong empirical support for our hypotheses that review quality and reviewer credibility drive information usefulness and that information usefulness, in turn, drives consumers' attitudes toward and their intention to purchase from a brand. Using PLS multi-group analysis, we further explored the moderating role of review valence—positive versus negative—and found significant differences in the importance of the drivers of information usefulness and its consequents. We discuss our study's implications for theory and practice.

Keywords: Online Reviews, Electronic Word of Mouth (eWOM), Information Adoption Model, Source Credibility, Review Characteristics, Review Quality, Review Valence, Review Usefulness, Brand Attitude, Purchase Intention.

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1   Introduction

Online reviews, a specific subset of electronic word of mouth (eWOM), have become an integral component of consumers' information-seeking behavior and subsequent purchase decision making and, therefore, a powerful marketing tool (Bickart & Schindler, 2001; Gruzd, 2013; Kumar & Benbasat, 2006; Lak & Turetken, 2017; Zhang, Craciun, & Shin, 2010). Online reviews allow consumers to reduce the uncertainty and risk associated with purchase decisions and, therefore, increase their level of confidence during such decision making processes (Pitta & Fowler, 2005).

For the travel sector, TripAdvisor has become the go-to source for travel information. At the time of this paper's writing, TripAdvisor hosted more than 600 million traveler reviews and opinions for approximately 7.5 million properties across 49 countries around the world (TripAdvisor, 2018). Tourism, as a sector, has always featured intense information-seeking behaviors (previously through travel agencies and travel guides). However, with the rise of online tourism, users can now make their own travel arrangements and rely on the reviews of other users like themselves to make choices.

Prior research in the area of eWOM largely falls into two broad areas: 1) an area that focuses on the characteristics of online reviews and reviewers that usually represent upstream antecedents and 2) an area that focuses on the outcomes or consequents of online reviews.

Research in the first area has largely explored characteristics of reviews and the factors that affect the perceived credibility of online consumer reviews. For instance, Cheung, Sia, and Kuan (2012) examined review consistency and sidedness. Other review characteristics that have received a lot of attention include review valence (commonly referred to as sentiment) (Benedicktus & Andrews, 2006; Gruzd, 2013; Lak & Turetken, 2017; Stauss, 2000), review accuracy (Nelson, Todd, & Wisom, 2005; Yoo, Kim, & Sanders, 2015; Cheung, Lee, & Rabjohn, 2008), and review currency (Kahana, Howard, Zaromb, & Wingfield, 2002; Wathen & Burkell, 2002). Furthermore, beyond a review's credibility, some research has examined reviewers' perceived credibility (i.e., how much of an expert reviewers are with respect to the particular product or service) (Cheung et al., 2008; Cheung, Luo, Sia, & Chen, 2009) as an additional antecedent that affects the information processing that occurs when consumers read online reviews.

Research in the second area has demonstrated that online customer reviews help to shape brand attitudes and affect subsequent purchase intentions (Chen, Dhanasobhon, & Smith, 2001; Cheung et al., 2009; Chevalier & Mayzlin, 2006; Dellarocas, Zhang, & Awad, 2007; Liu, 2006; Zhu & Zhang, 2010; Bickart & Schindler, 2001; Chan & Ngai, 2011; Park, Lee, & Han, 2007; See-To & Ho, 2014). Indeed, much of the research on eWOM in general and online reviews in particular has focused on these perceptual outcome measures.

Yet, despite the substantial interest in user-generated online reviews, little research brings these two areas of research—antecedents and consequents—together. To fill this gap, we address the following overarching research question (RQ):

> **RQ**:   What are the antecedents and consequents of information usefulness in the context of online reviews?

In order to answer this question, we extend the information adoption model (IAM) with constructs from consumer research—specifically, brand attitude, and purchase intention—and propose a comprehensive model of antecedents and consequents of information usefulness in the context of online reviews.

Furthermore, to add further sophistication to our extended theoretical model, we explore the moderating role of review valence by conducting a multi-group analysis using the comprehensive path model. This multi-group moderation shows that the relative importance of the antecedents change depending on the nature of the review and similar differences occur in the downstream relationships between the endogenous constructs—usefulness, attitude, and intention—depending on the valence nature of the review.

Our findings not only help to establish a comprehensive model that brings together two diverging areas of research in the context of eWOM and online reviews but also help to establish the importance of different characteristics depending on the nature of the review. These insights not only add depth to our knowledge of consumer decision making but also may assist practitioners to develop appropriate responses to customers depending on the review valence, currency, and accuracy these respondents have been exposed to.

2 Prior Research

As we mention in Section 1, online reviews have become extremely influential given that Internet users generally perceive them to be "real" and "credible" compared to information that companies themselves generate about their brands (Aicher et al., 2016; Boon, Bonera, & Bigi, 2014; Chen & Xie, 2010; Cheung et al., 2008, 2009; Dellarocas et al., 2007). The ever-growing set of online information helps consumers minimize uncertainty surrounding brands they are considering and the risk associated with corresponding purchase decisions.

Online reviews are peer-generated, text-based evaluations of products or services that individuals post on either the company's or a third-party website (Mudambi & Schuff, 2010; Cheung et al., 2012). Consumers not only actively create but also share these appraisals (Stauss, 1997) and, thereby, facilitate interactions and exchanges between Internet users regarding their experiences with a brand (Boush & Kahle, 2001; Hu, Liu, & Zhang, 2008; Preece & Shneiderman, 2009).

Online reviews have become an important area of research, specifically in the context of studies on electronic word of mouth (eWOM) (Cheung et al., 2012), which researchers generally define as "any positive or negative statement made by potential, actual, or former customers about a product or company, which is made available to a multitude of people and institutions via the Internet" (Hennig-Thurau, Gwinner, Walsh, & Gremler, 2004, p. 39).

Prior research on eWOM largely falls into two broad areas: 1) research on eWOM's antecedents and 2) research on eWOM's consequences (King, Racherla, & Bush, 2014; Nyilasy, 2005). From systematically reviewing 67 peer-reviewed papers on online reviews, Kwok, Xie, and Richards (2017) further underscore this finding in showing that most studies to date have focused on effects of review characteristics on perceptions of helpfulness and the effects stemming from these perceptions for the receiver and the brand more generally.

The first area of research centers on the causes and motivations that underpin people's engagement with eWOM (see Cheng & Ho, 2015; Erkan & Evans, 2016; Filieri 2015; Gunawan & Huarng, 2015; Liang, Ekinci, Occhiocupo, & Whyatt, 2013;), which can pertain to two units of analysis: the sender and the receiver. At the level of the sender, much research has examined why people share online reviews; at the level of the receiver, much research has centered on the motivations for why people use online reviews.

The second area of research focuses on the consequences or effects associated with eWOM and online reviews. Again, we can distinguish the same units of analysis in this research domain: some studies have examined the effects of sharing online reviews for the sender (i.e., the author) (see Benlian, Titah, & Hess, 2012), but the vast majority have explored the power of eWOM by focusing on the consequences that arise from receivers' using online product or service information, such as effects on brand attitude and purchase intention (see Sparks & Browning, 2011).

While substantial research has addressed the issue of antecedents or consequents, we have limited knowledge about the comprehensive set of relationships that exists when one integrates both antecedents and consequents into the same model and adopts a multi-group analysis perspective to analyze the difference in path strengths and explained variance for consumers exposed to positive versus negative reviews. Hence, in this study, we integrate antecedents and consequents of information usefulness (Racherla & Friske, 2012) using an extended information adoption model (IAM) and explore a multi-group moderation to reveal the impact of review valence (see Jeong & Jang, 2011; Sheng & Joginapelly, 2012).

3 Theoretical Background

This study extends the information adoption model (IAM) (Sussman & Siegal, 2003) with constructs from consumer research to explore both upstream antecedents and downstream consequences of perceptions of information usefulness in the context of online reviews. To do so, we review the literature on IAM and discuss the key constructs from consumer research (specifically, brand attitude and purchase intention). In Section 4, we present our comprehensive research model of both antecedents and consequences of information usefulness.

3.1 Information Adoption Model

The information adoption model (IAM) focuses on understanding how people internalize and appropriate information (Nonaka, 1994) and, specifically, how exposure to identical information or content may have

differential effects for different recipients (Chaiken & Eagly, 1976; Cheung et al., 2008). Given IAM focuses on explaining how information influences people—especially in the context of computer-mediated communication and technology—IAM is extremely suitable for investigating eWOM in general and online reviews in particular (Cheung et al., 2008; Cheung et al., 2009; Shu & Scott, 2014).

IAM results from an integration of existing models about what drives people to adopt information or ideas—specifically the theory of reasoned action, the theory of planned behavior, and technology acceptance models (see Ajzen, 1985, 1991; Davis, 1989; Fishbein & Ajzen, 1975)—with insights from dual process theories and, specifically, the elaboration likelihood model (ELM) (Petty & Cacioppo, 1986; Petty, Cacioppo, & Goldman, 1981). The latter posits that the same content can have differential effects depending on how the individual user or consumer processes that content (i.e., whether the user uses either a central or peripheral route) (Shen, Cheung, & Lee, 2013; Sussman & Siegal, 2003).

When using the central route for processing information—for instance, from online reviews—users or consumers are influenced by messages' core components (Cheung et al., 2008; Petty & Cacioppo, 1986; Shu & Scott, 2014)—most importantly, the perceived quality of the message. Inversely, when using the peripheral route, users or consumers are affected by and make judgments based on ancillary cues—most importantly, the credibility of the review(er), commonly referred to as source credibility (Cheung et al., 2008; Petty & Cacioppo, 1986; Shu & Scott, 2014).

As such, IAM encompasses four components: argument quality (which represents the central route of information processing from ELM), source credibility (which represents the peripheral route of information processing from ELM), information usefulness, and information adoption. However, IAM provides only limited insights into the consequents of information usefulness (Featherman, Wright, Thatcher, Zimmer, & Pak, 2011), and the ultimate dependent variable of information adoption has only limited applicability to the eWOM and online review context. Hence, in Sections 3.2 and 4.2, we expand IAM with two key constructs from consumer research: brand attitude and purchase intention.

3.2 Integrating IAM with Consumer Research: Brand Attitude and Purchase Intention

The brand attitude and purchase intention constructs, which represent important perceptual proxies for intended consumer beliefs and behaviors (Bhattacherjee & Sanford, 2006), form the heart of consumer research.

Brand attitude, one of the most widely examined constructs in consumer behavior, has been an important concept in marketing research for the past 20 years. By better understanding the underlying causal dynamics of attitude formation and image interpretation, organizational managers acquire greater clarity that can inform successive (and likely more effective) marketing communications (Mitchell & Olson, 1981).

Researchers often recognize brand attitude as a consumer's overall evaluation of a brand. These attitudes often shape consumers' predispositions towards brands as Fishbein and Ajzen (1975) describe: they define an attitude as a "learned predisposition to respond in an either consistently favorable or unfavorable manner with respect to a given object". In essence, that evaluation becomes a function of salient beliefs about the brand—those from memory and considered by consumers in a given situation (Faircloth, Capella, & Alford, 2001).

Researchers have defined brand attitude specifically in a variety of ways that focus on "impressions toward the advertised brand" (see Mao & Krishnan, 2006), "the extent to which consumers felt good about the brand, the extent to which they liked the product and the extent to which they believed the brand was a good one" (MacInnis, Rao, & Weiss, 2002), and "someone's inner feeling that shows whether he likes or dislike something" (Schiffman & Kanuk, 2007). Taken together, these definitions show that attitude is highly correlated to people's predisposition to act in a good or bad way in relation to something and according to their inner feelings, emotions, and evaluation.

Studies in consumer research have often used purchase intention as the ultimate dependent variable in the absence of actual behavioral information regarding purchases (i.e., transactional data). Purchase intention here refers to consumers' behavioral inclination to plan to purchase a certain product or service in the future (Dodds, Monroe, & Grewal, 1991). Purchase intention is related to a consumer's willingness to purchase from a brand and, thus, the probability that the consumer will actually do so; more precisely, researchers have defined it as "the likelihood that customers will complete purchases" (Jiang & Benbasat,

2007). In line with TPB, researchers see intention as a critical antecedent of actual behavior and positive purchase intention as an important precursor to actual purchase action (Fishbein and Ajzen, 1975).

However, research has shown that measuring purchase intention can prime purchase processing decisions in favorable ways toward the brand. Indeed, multiple studies have shown that simply asking questions regarding purchase intention increases brand purchase rates and market shares (Morwitz, Johnson, & Schmittlein, 1993; Fitzsimons & Morwitz, 1996).

4   Research Model and Hypotheses

This study extends the IAM (Sussman & Siegal, 2003) through integrating it with key constructs from consumer research (brand attitudes and purchase intention) to offer a comprehensive framework for the antecedents of information usefulness and the attitudinal and behavioral consequents of perceptions of usefulness in the context of online reviews. We structure the development of our hypotheses around the two core areas of online review and eWOM research: antecedents and consequents.

4.1   The Antecedents of Information Usefulness of Online Reviews: Review Quality and Source Credibility

Almost every user on the Internet can generate eWOM information; therefore, quality and credibility of information have now become more critical (Xu, 2014). Consumers approach products and services more eagerly when the information satisfies their demands (Olshavsky, 1985). In fact, prior research has offered support for the downstream positive effect of information (i.e., online review) quality on consumers' purchase intentions (Lee & Shin, 2014; Park et al., 2007). In this section, we look at the two antecedents of information usefulness: information (i.e., review) quality and information source (i.e., reviewer) credibility.

Two key dimensions shape information quality: accuracy and currency. Accuracy represents the user's perception that the information is correct, and currency represents the user's perception of the degree to which the information is up to date[1]. These two dimensions determine the user's perception of the quality of the information that a review includes (i.e., review quality), which we elaborate on below.

Information currency represents the user's perception of the degree to which said information is up to date (Wixom & Todd, 2005). For online reviews, it refers to their recency, which is strictly related to the review's date of publication. For the present research, we perceive currency as a measure of the time elapsed from the moment a specific review appears to the moment a user consults it (Berendt et al., 2004). As TripAdvisor.com mentions: "recent reviews are more valuable to our travelers than older ones" (TripAdvisor, 2017). Recent, timelier contributions give more fresh and authentic opinions of traveler experiences than dated ones, and they help readers obtain up-to-date insights and suggestions. Also, the website popularity index algorithm places more worth on more recent reviews (even if negative) than older ones and, thus, assigns them greater weight in determining a hotel's overall ranking value.

Researchers have defined information accuracy as "the freedom from mistakes in the information content" (Yoo et al., 2015) and as "the degree to which information is correct, unambiguous, meaningful, believable, and consistent" (Nelson et al., 2005). Information accuracy, then, refers to a subjective (user) perception that the information one acquires or retrieves online is correct and, thus, valuable. Researchers have studied the contextual nature of this value in two ways: 1) by considering the relative importance of accuracy along with other factors in order to reduce uncertainty and equivocality of the information provided (Daft & Lengel, 1986) or 2) by positing that accuracy is significant only in relation to (i.e., when the possibility exists for) the user to either confirm or disconfirm the accuracy of the information itself (e.g., if a user has previously never read an online review or never stayed in a hotel, it will be difficult for the user to assess whether the information is accurate) (Cheung et al., 2008).

Much psychology research has studied the second antecedent of information usefulness, source credibility, by exploring how intrinsic attributes affect the credibility of a source. For example, McGuire (1968) analyzed intrinsic attributes such as trustworthiness, expertise, and attractiveness and their effects on credibility and, ultimately, someone's attitude towards said source. The author found that high source credibility induces greater positive attitude and credibility toward the position, content, or suggestions that

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[1] We selected these two antecedents to information quality due to their widespread use, representativeness, and relevance to online reviews that we explore in this study. This list is not necessarily exhaustive.

that source advocates (Hovland & Weiss, 1951). Although McGuire and other authors who have conducted similar work did so in offline environments, recent studies have replicated these findings in the online environment (see Tidwell & Walther, 2002; Dellarocas, 2003; Litvin, Goldsmith, & Pan, 2008).

Lastly, information usefulness refers to people's perception that using newly acquired information will enhance their performance (Bailey & Pearson, 1983; Cheung et al., 2008). Researchers consider information usefulness as a main predictor of information adoption (Davis, 1989; Sussman & Siegal, 2003) and purchase intention (Lee & Koo, 2015) because people tend to engage with the information when they think it is useful. In social media in particular, people encounter a great amount of eWOM information (Chu & Kim, 2011); therefore, they might have greater intention to adopt when they find the information useful. As such, IAM affords insight into the mechanism that links information quality and source credibility with downstream outcomes, which includes purchase intention through the posited mediator of information usefulness. Hence, we propose that:

H1:   Consumer-perceived quality of an online review has a positive effect on consumer-perceived information usefulness of the online review.

H2:   Consumer-perceived credibility of an online reviewer has a positive effect on consumer-perceived information usefulness of the online review.

4.2   The Consequents of Information Usefulness of Online Reviews: Brand Attitude and Purchase Intention

In an online environment, the perceived usefulness of the gathered information plays an interesting role in determining whether a user is inclined towards a specific brand or service rather than another (Schiffman & Kanuk, 2007). Thus, if a user perceives information about a brand positively, the user would be more favorably predisposed to that brand. Similarly, if a user perceives information about a brand negatively, the user would be more unfavorably predisposed to the brand. Brand attitude, one of the most widely examined constructs in consumer behavior, captures this predisposition. Brand attitude refers to an individual's internal evaluation of an object such as a branded product (Faircloth et al., 2001; Mitchell & Olson, 1981). This internal evaluation is an "overall feeling" (Bergkvist & Rossiter, 2007) and a function of salient beliefs that individuals retain in their memory and activate during a purchase decision (Mitchell & Olson, 1981). Hence, we propose that information usefulness interacts with review valence to produce two distinct effects on brand attitude:

H3a: Consumer-perceived information usefulness of a positive online review has a positive effect on a consumer's attitude towards the brand that the review discusses.

H3b: Consumer-perceived information usefulness of a negative online review has a negative effect on a consumer's attitude towards the brand that the review discusses.

To consider the downstream effects of information usefulness, we turn to the rich stream of literature that has emerged from extending and applying TRA to the technology acceptance model (TAM) (Davis, 1989) and, ultimately, the unified theory of acceptance and use of technology (UTAUT) (Venkatesh, Morris, Davis, & Davis, 2003). Through this theoretical grounding, the link between object-based beliefs, attitudes, and behaviors emerges. However, while research has found general attitudes to modestly predict specific behaviors (Ajzen & Fishbein, 2005, p. 28), it has found beliefs and attitudes (such as information quality and information usefulness, respectively) about a specific behavior (e.g., the booking of a hotel) in a particular context (e.g., professional) at a particular point in time (e.g., in the next 3 months) to predict intention and behavior (see Bhattacherjee & Sanford, 2006; Nabi & Hendriks, 2003; Potgieter & Naidoo, 2017; Prendergast, Ko, & Siu Yin, 2010); it is plausible, after all, given that information usefulness assesses the consequences that arise when one uses specific information to accomplish some task (i.e., select and book a hotel) (Wixom & Todd, 2005). Hence, and considering the interaction effect of information usefulness with review valence, we propose that:

H4a: Perceptions of information usefulness of a positive online review has a positive effect on a consumer's intention to purchase from the brand that the review discusses.

H4b: Perceptions of information usefulness of a negative online review has a negative effect on a consumer's intention to purchase from the brand that the review discusses.

Brand attitudes are a precursor for customer activities such as recommending the brand to others and making repeat purchases (Chung, Lee, & Heath, 2013). This rationale concurs with the evidence that

brand equity is an asset to a business and, thus, that it leads to more positive future-term financial performance (Chang & Liu, 2009; Aaker & Jacobson, 2001) through incremental sales. While prior research overall has found inconclusive results about whether brand attitude consistently predicts purchase intention or actual behavior, some findings offer support for the expected relationship: for instance, Baldinger and Rubinson (1996) found that two thirds of the brands they studied had their market share increase whenever their brand attitude became more positive. Similarly, evidence exists in the consumer research literature that the more positive the brand attitude, the higher consumers' purchase intention (Chang & Liu, 2009; Lee & Yoo, 2009; van der Heijden, Verhagen, & Creemers, 2003). Purchase intention here refers to consumers' behavioral inclination to purchase a certain product or service in the future (Dodds et al., 1991). Positive purchase intention, in turn, is an important antecedent to actual purchase action (Brown & Stayman, 1992; Fishbein & Ajzen, 1975). Therefore, we propose that:

H5: Brand attitude has a positive effect on purchase intention.

4.3 Proposed Research Model

Figure 1 shows our proposed research model that builds on the aforementioned hypotheses.
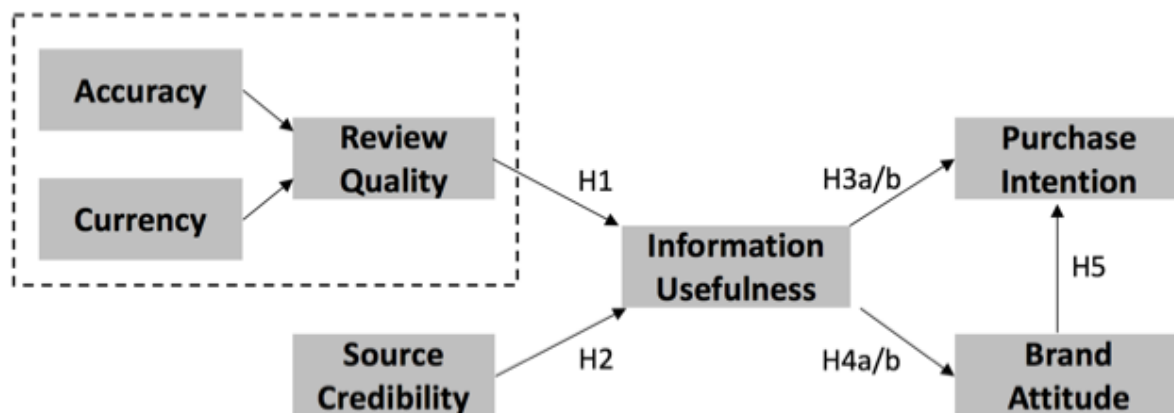
Figure 1. Proposed Research Model

5 Research Design and Methods

We use an experimental design to manipulate a variety of review characteristics in order to introduce variance into perceptions of review quality and review source credibility. In this section, we detail the study context, the experimental design, how we operationalized the constructs, and the data-collection and analysis methods.

5.1 Study Context: TripAdvisor.com

Today, TripAdvisor constitutes the world's leading travel website. For traveling purposes, travelers all over the world know TripAdvisor well and use it to find information related to hotels, restaurants, tours, and other holiday rentals and needs. TripAdvisor offers an easy and clear format for people to review hotels. In order to review a new hotel or simply comment on an existing one, a user needs to be a registered member of the community and to have logged on the website. Other users (i.e., potential customers) are then able to find submitted reviews of properties they are considering. Readers can also see who the review author's identity; moreover, TripAdvisor assigns a contribution level from one to six to every reviewer depending on how active that person is in terms of contributions (i.e., reviews and comments). This contribution level allows review authors to gain credibility and, in turn, assist other consumers in their decision making processes.

5.2 Experimental Design and Procedure

This study follows a two (negative vs. positive) by two (old vs. recent) by two (short vs. long) by two (non-credible vs. credible) experimental design. Thus, we created sixteen experimental groups and exposed the respondents in each experimental group to three reviews that were consistent in their nature per the

experimental condition that we assigned them to. For this purpose, we selected actual hotel reviews from the TripAdvisor platform for a total of 48 reviews (i.e., three per experimental condition). Table 1 lists the experimental groups and their respective conditions, and Figure 2 provides detailed examples of the conditions.

The experiment used a scenario-based approach (i.e., during the online session, we presented respondents with a fictitious scenario to ensure they were fully immersed in the situation and perceived the stimuli—the three reviews—as meaningful). The specific scenario that we presented to all respondents was that of a solo business trip to London (UK) in which money was not a factor. The trip had been scheduled for the end of November and would last approximately one week (from the 21st to the 25th). We also informed respondents that, given their work responsibilities, they would find a hotel with a central location, free Wi-Fi, and breakfast included as desirable.

We specifically selected reviews for the *Travelodge London Kings Cross Royal Scot* hotel for two reasons: 1) the vast amount of reviews available for the hotel and 2) the hotel's average overall reputation. Given that the property had over 2,500 reviews (of which 2,170 were in English) on TripAdvisor, we had significant material to choose from in selecting three reviews for each experimental condition. Furthermore, according to the bubble ranking system that TripAdvisor uses, this hotel had three bubbles out of five, which means that it had an average reputation, was in line with the average rating of all properties, and it included both negative and positive reviews, which we needed to be able to select reviews for the experimental conditions. In particular, on 25 October, the hotel had 985 positive (four bubbles = very good or five bubbles = excellent) reviews and 578 negative (two bubbles = poor or one bubble = terrible) reviews.

We selected reviews so that they would align with the scenario and so we could successfully manipulate the four review characteristics of interest:

- Valence (negative vs. positive): we assessed the overall valence based on the bubble rating system that TripAdvisor uses. We selected reviews with either five or four bubbles for positive valence condition and reviews with either one or two bubbles for the negative valence condition.

- Currency (old vs. recent): with respect to the time period when we conducted the experiment, we considered reviews no more than three months old as recent and reviews more than 12 months old as dated.

- Accuracy (short vs. long): reflecting "unambiguous, meaningful, believable, and consistent" information, we considered more elaborate reviews that detailed the experience as more accurate. To satisfy face validity for linguistic/grammar fluency, we captured the extent of the details embedded in the review via a proxy: characters used. The average English word comprises 4.5 characters (Cryptography, 2017), and the average online review is 155 words—based on the average positive online review being 120 words and the average negative online review being 191 words (Lu, Dong, & Smyth, 2016). Thus, we considered online reviews with more than 160 words as long and those with less than 80 words (i.e., one half of the average review length) as short.

- Source credibility (low vs. high): we manipulated the attributes associated with each reviewer for each of the two credibility conditions (i.e., low vs. high) as follows: 1) low credibility condition: a source with a level zero or level one contributor level; a source having posted one to three online reviews; a source having no or one hotel review; a source having earned no "helpful" votes from peer TripAdvisor users); 2) high credibility condition: a source with a level four to six contributor level; a source having posted multiple (i.e., 29 or more) reviews; a source having several (i.e., eight or more) hotel reviews; a source having several (i.e., three or more) "helpful" votes from peer TripAdvisor users.

Table 1. Overview of Experimental Groups and Conditions

Group/condition	Sample review titles	Group/condition	Sample review titles
Group 1: positive + recent + long + credible	"Good location (close to metro and bus) and good value for budget stay…" "Very reasonable, lovely staff…"	**Group 9**: positive + old + long + credible	"Great value and comfort…" "Very good…" "Pleasantly surprised…"
Group 2: negative + recent + long + credible	"Where to begin…" "You get what you pay for…" "Close to public transport…"	**Group 10**: negative + old + long + credible	"Stains on the sheets…" "Would not stay again…" "DATED AND SHABBY…"
Group 3: positive + recent + long + non-credible	"Lovely staff!..." "Fabulous stay…" "We enjoyed our stay…"	**Group 11**: positive + old + long + non-credible	"Comfort from the chaos of travelling to Kings Cross…" "Good location, pleasant stay…"
Group 4: negative + recent + long + non-credible	"Where do I start…" "Worst hotel experience in my life …"	**Group 12**: negative + old + long + non-credible	"Never again…" "Worst hotel stay ever…"
Group 5: positive + recent + short + credible	"Great stay." "Good central location but very pricey."	**Group 13**: positive + old + short + credible	"Comfortable, clean rooms." "Excellent staff."
Group 6: negative + Recent + Short + Credible	"Do not stay here." "Needs improvement."	**Group 14**: negative + old + short + credible	"Never again." "Not a great place." "AWFUL."
Group 7: positive + recent + short + non-credible	"Business trip in London." "Good night's sleep."	**Group 15**: positive + old + short + non-credible	"Excellent hotel." "Wonderful staff." "Great location."
Group 8: negative + recent + short + non-credible	"Run down hotel and that is not kept clean." "Terrible and no value for money with miserable staff."	**Group 16**: negative + old + short + non-credible	"Don't stay here – unclean." "Water pipes." "Stopover."

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Figure 1. Sample Experimental Condition: Positive + Recent + Short + Credible (Scenario 7)

5.3 Operationalization of Constructs

Table 2 summarizes how we operationalized all constructs in our research model with sample items (for a full overview of all construct items, please see Appendix A). We adapted all constructs from previously validated scales.

Table 2. Operationalization of Constructs

Construct	Description	Sample item (7-point Likert)	References to sources of adapted scales
Review currency*	The respondent's perception of the recency of the provided information	"The reviews are up-to-date"	Wixom & Todd (2005)
Review accuracy*	The respondent's perception that the information is correct	"Information provided in the review is correct	Wixom & Todd (2005)
Review quality	Second-order construct encompassing review Currency and Accuracy	N/A	N/A
Reviewer credibility	The respondent's perception of the trustworthiness of the reviewer	"The person who wrote the review was knowledgeable in evaluating the hotel"	Bhattacherjee & Stanford (2006)
Review usefulness	The respondent's perception of the value of the information provided	"The information provided is valuable"	Bailey & Pearson (1983)
Brand attitude	The respondent's inner feelings of liking or disliking a brand	"Overall my impression of this hotel is" (strongly positive/negative)	Adapted from Lee, Hsu, Han, & Kim (2010)
Booking intention	The respondent's likelihood of completing the booking	"If I needed a hotel room in the near future, I would consider reserving one from this hotel"	Everard & Galletta (2005)
* We used review accuracy and currency as first-order constructs that underpin perceived review quality (second-order).			

5.4 Data Collection

We distributed the final online experiment and survey using Qualtrics. We shared a link to the survey through an emailing platform service at two universities in France and in the Midwest US. This convenience sample comprised typical users of the platform (i.e., TripAdvisor) and function (i.e., online reviews) we studied. A total of 701 recipients enrolled in business courses viewed the online survey invitation.

5.5 Sample and Respondents

In all, 701 recipients viewed the invitation, and 376 proceeded to complete it. After removing outliers and unengaged responses (on the basis of a 0.0 standard deviation in their responses to all construct items), 355 valid answers remained. Hence, the (usable) response rate was 50.6 percent. From the final 355 respondents, 45.1 percent were male and 54.9 percent female. Table 3 summarizes the final distribution across the 16 experimental conditions.

Table 3. Frequency Distribution of Participants by Scenario

Scenario	Freq.	Scenario	Freq.	Scenario	Freq.	Scenario	Freq.
1	24	5	29	9	19	13	25
2	23	6	26	10	20	14	22
3	15	7	23	11	20	15	26
4	20	8	20	12	20	16	23

6   Analysis and Results

After cleaning the data, we imported the final sample of 355 valid responses into SmartPLS to validate the measurement and structural model and conduct the exploratory multi-group analysis of the moderating effect of review valence[2]. Additionally, we used SPSS for post hoc manipulation checks.

6.1   Construct and Measurement Model Validation

Using SmartPLS (v3.2.4), we validated the measurement model. The SRMR of the proposed research model was .049 (below 0.8 threshold) and the NFI was 0.9 (> 0.9) (Lohmöller, 1989), which demonstrate adequate model fit (Hu & Bentler, 1998). Table 4 summarizes the construct statistics. Both measures of reliability—Cronbach's alpha and composite reliability (CR)—evidence adequate construct reliability because all values exceeded 0.7 (Hair, Black, Babin, & Anderson, 2010). Further, all factor loadings for all latent variables in the model exceeded 0.7 (Hair et al., 2010) and all AVE scores exceeded the 0.5 threshold, which demonstrate adequate convergent validity (see Table 4) (Malhotra & Dash, 2011).

Table 4. Construct Reliability and Convergent Validity

Construct	Cronbach's alpha	Composite reliability	Average variance extracted (AVE)
Review currency	0.896	0.935	0.828
Review accuracy	0.837	0.902	0.755
Source (reviewer) credibility	0.825	0.883	0.657
Review usefulness	0.85	0.909	0.769
Brand attitude	0.976	0.982	0.932
Purchase (booking) intention	0.959	0.97	0.891

Furthermore, to determine discriminant validity, we conducted a Fornell-Larcker test (Fornell & Larcker, 1981) (Table 5) and found adequate discriminant validity for all constructs given that all diagonal values (square root of AVE) exceeded the other values to the left and bottom.

Table 5. Fornell-Larcker Test of Discriminant Validity

Construct	Review currency	Review accuracy	Source credibility	Usefulness	Brand attitude	Purchase intention
Review currency	**0.869**					
Review accuracy	0.477	**0.91**				
Source credibility	0.651	0.477	**0.81**			
Usefulness	0.547	0.378	0.607	**0.877**		
Brand attitude	0.141	0.019	0.041	-0.085	**0.966**	
Purchase intention	0.148	0.018	0.085	0.648	0.907	**0.944**
Values on the diagonal represent the square root of AVE; values below the diagonal represent latent variable correlation						

Before we detail how we tested the hypotheses, we first computed a second-order perceived quality construct based on the first-order constructs of review currency and review accuracy, each of which had already demonstrated adequate construct validity and reliability. Furthermore, we validated whether the relationships from the first-order constructs to the second order quality construct were significant (i.e., t > 1.96), which we confirmed (accuracy: t = 7.006; currency: t = 3.809). Hence, in the rest of the paper, we proceed with our proposed research model that excludes the first-order constructs (currency and accuracy) and instead use the second-order quality construct.

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[2] We selected PLS-SEM because our model focuses on predicting key target constructs—brand attitude and purchase intention)—that eWOM research has not previously analyzed, includes the identification of key driver constructs, is exploratory in nature (given the combination of the information adoption model with constructs from consumer research), and includes a second-order construct (Hair, Ringle, & Sarstedt, 2011; Lowry & Gaskin, 2014)

6.2   Hypothesis Testing

Using SmartPLS (v 3.2.4) bootstrapping, we tested the hypotheses that underpin our comprehensive model of antecedents and consequents of information usefulness. Table 6 provides the results.

First, our results show that both antecedents of information usefulness—review quality (β= 0.254; p = .000) and reviewer credibility (β= 0.454; p = .000)—had a significant and positive effect on information usefulness, which confirms H1 and H2. Both antecedents accounted for 41.5 percent of the explained variance (R^2) in information usefulness perceptions (R^2 = 0.415; Adj. R^2 = 0.411).

Second, our results show that information usefulness had a strong positive effect on brand attitude (β= 0.475; p = .000) when the respondent read positive reviews during the experimental manipulation, which provides strong empirical support for H3a. Furthermore, information usefulness had a strong negative effect on brand attitude (β= -0.372; p = .000) when the respondent read negative reviews during the experimental manipulation, which provides strong empirical support for H3b. Results from a multi-group analysis (PLS-MGA) of the path coefficient difference for respondents exposed to positive versus negative reviews reveals that this difference was significant (path coefficient difference = .604; p = .000). The explained variance of brand attitude was 23.2 percent in the positive condition and 22.8 percent in the negative condition (R^2 = 0.232 and 0.228; adj. R^2 = 0.219 and 0.214, respectively).

Third, our results show that information usefulness had a strong, direct effect on purchase intention (β= 0.238; p = .005) when the respondent read positive reviews during the experimental manipulation, which provides strong empirical support for H4a. However, for those respondents in the negative conditions, we found no negative effect of information usefulness on purchase intention (β= -0.030; p = .661), which does not support H4b. Results from a multi-group analysis (PLS-MGA) of the path coefficient difference for respondents exposed to positive versus negative reviews reveals that this difference was significant (path coefficient difference = .268; p = .018).

Fourth, beyond the direct effect of information usefulness on purchase intention, we also explored the mediated effect through brand attitude. We found that brand attitude was an extremely significant predictor of purchase intention (β= 0.910; p = .000), which provides strong empirical support for H5. Jointly, information usefulness and brand attitude accounted for 82.3 percent of the explained variance (R^2) in purchase intention (R^2 = 0.823; Adj. R^2 = 0.822).

Table 6. Results of Hypotheses Testing

Hypothesis	Regression weights	T-statistic	Result
H1: Review quality -> information usefulness (+)	0.254	4.393***	Supported
H2: Reviewer credibility -> information usefulness (+)	0.454	8.484***	Supported
H3a: Information usefulness -> brand attitude (+) **H3b**: Information usefulness - > brand attitude (-)	0.475 -0.372	6.736*** 3.650***	Supported Supported
H4a: Information usefulness -> purchase intention (+) **H4a**: Information usefulness -> purchase intention (-)	0.651 -0.030	2.831** 0.438[n.s.]	Supported Not supported
H5: Brand attitude -> purchase intention (+)	0.910	64.190***	Supported
** is p < .05; *** is p < .01, n.s. = not significant			

6.3   Exploratory Analysis of Moderation Effect of Review Valence

To explore if the review valence of the experimental condition to which we exposed respondents moderated the validated path model, we conducted a multi-group analysis (PLS-MGA). We already conducted multi-group analyses for H3 and H4 as part of the main model validation and confirmed that both relationships (information usefulness to brand attitude and information usefulness to purchase intention) significantly differed when comparing respondents exposed to positive versus negative reviews.

In conducting the multi-group analyses (PLS-MGA) for the other hypotheses, we found that the path from brand attitude to purchase intention also significantly differed (t = 2.041 and p = .042) between those respondents exposed to positive versus negative reviews with a path coefficient difference of 0.181 (positive: β = 0.639; negative: β = 0.820). Interestingly, none of the antecedent paths to information usefulness significantly differed, although the strength of the effect of review quality on information

usefulness doubled for those exposed to negative reviews as opposed to positive reviews, whereas the strength of the effect of reviewer credibility was much greater for those exposed to positive reviews as opposed to negative reviews. Nonetheless, these differences in path coefficients (quality: path coefficient difference = 0.117; t = 1.044; and p = 0.297; credibility: path coefficient difference = 0.152, t = 1.494; and p = 0.136) were not significant.

Figures 3 and 4 show the models for respondents in the positive and negative review conditions, respectively.
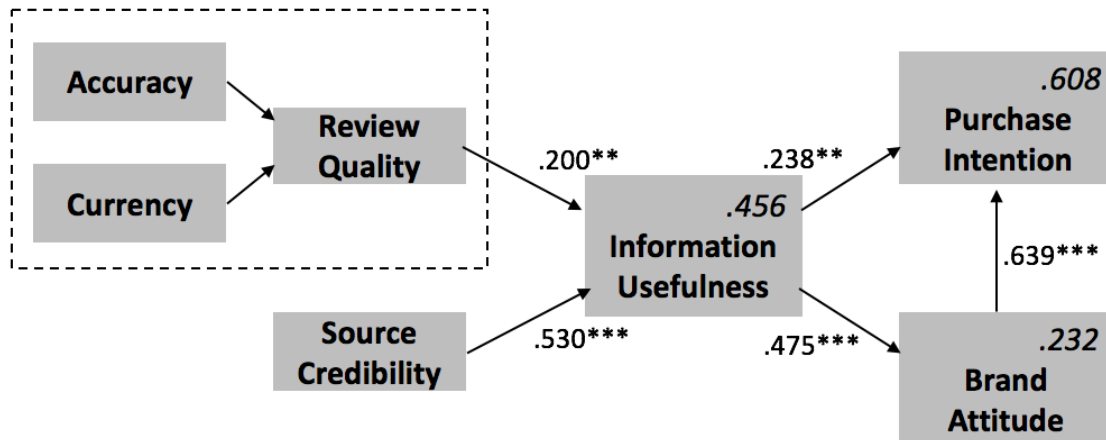
Figure 3. Validated Models for Positive Valence Conditions
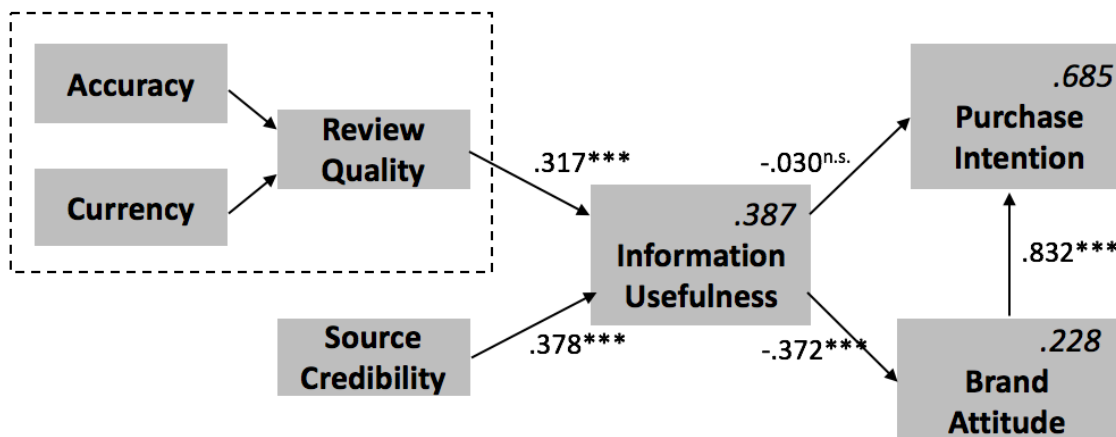
Figure 4. Validated Models for Negative Valence Conditions

6.4   R² partitioning of Information Usefulness and Purchase Intention

Further, we employed SPSS to conduct R^2 partitioning of both information usefulness and purchase intention to determine which drivers were stronger.

For information usefulness, we found that, in the overall model (both positive and negative reviews), the R2 was .415 (of which quality explained 16.5%and credibility explained 25.0%). For those exposed to positive reviews, the overall R^2 was .456 (of which quality explained 15.7% and credibility explained 29.9%). For those exposed to negative reviews, the overall R^2 was .387 (of which quality explained 18.0% and credibility explained 20.7%). Hence, it appears that the role of quality is more important for negative reviews than positive reviews and that the reverse held true for credibility.

For purchase intention, we found that, in the overall model (both positive and negative reviews), the R^2 was .824 (of which information usefulness explained .002% and brand attitude explained 82.2%). For those exposed to positive reviews, the overall R^2 was .608 (of which information usefulness explained 17.1% and brand attitude explained 43.7%). We did not conduct R^2 partitioning for those in the negative condition given that information usefulness was an insignificant predictor of purchase intention.

6.5   Post Hoc Manipulation Checks and Exploration of Control Variables

We also conducted post hoc manipulation tests that showed that all experimental manipulations were successful as follows: review accuracy (F = 11.240; p = 0.001), review currency (F = 11.267, p = 0.001), and reviewer credibility (F = 11.372; p = .001).

Furthermore, we added two control variables pertaining to characteristics of the individual respond to the model: age (p = .173) and gender (p = .062); however, both proved to be insignificant. As such, we removed them from the final model.

7   Discussion

The ongoing attention that eWOM and online reviews continue to attract and the one-sided focus on either antecedents or consequents of information usefulness of online reviews provided the impetus for this study. Extending the information adoption model (IAM) with key constructs from consumer research, we used a structural equation modeling approach to validate our proposed research model and found strong support for all our hypotheses with the exception of information usefulness expected negative effect on purchase intention in the negative experimental condition. Furthermore, using multi-group analysis, we further explored the moderating role of positive and negative reviews and found that—beyond the anticipated results on the paths from information usefulness to brand attitude and purchase intention—the path from brand attitude to purchase intention was significantly weaker for those exposed to the negative condition than the positive condition. Furthermore, using R^2 partitioning, we found that the role of quality was more important in driving perceptions of information usefulness for those exposed to negative rather than positive reviews and that the reverse held true for credibility.

7.1   Theoretical Implications Future Research

From a research perspective, our findings contribute to the existing literature in three ways. First, our proposed comprehensive model of information usefulness extends the existing eWOM and online review literatures, which have previously focused on antecedents or consequents of information usefulness, respectively. Second, the insights about the differences between positive and negative conditions reveal that the role of information usefulness depends on the nature of reviews a consumer experiences. Specifically, when individuals experience negative reviews, the effect of information usefulness on purchase intention disappears, which means that brand attitude fully mediates the link between these two constructs. In contrast, in the positive condition, brand attitude partially mediates information usefulness's direct effect on purchase intention. Third, our findings also shed light on the relative importance of antecedents to perceptions of information usefulness: perceptions of quality are generally more important for those exposed to negative rather than positive reviews, and perceptions of reviewer credibility are a relatively stronger driver of usefulness perceptions for those exposed to positive rather than negative reviews.

Our findings and their implications reveal several directions for future research. First, future research, building further on the elaboration-likelihood model (ELM), should explore the differences between exposure to negative versus positive reviews further. Integrating ELM with theories about uncertainty avoidance would provide a theoretical explanation for the difference in impact of review(er) characteristics on perceptions of information usefulness. Specifically, being exposed to negative reviews increases uncertainty and anxiety and, therefore, should activate the central route of information processing, which, in turn, should increase one's focus on components of the message (most importantly, quality). However, being exposed to positive reviews does not induce uncertainty and, therefore, should activate the peripheral route, which, in turn, should cause one to form opinions based on meta-information about the message (most importantly, source credibility). Researchers have not studied this relationship between review valence and information processing, but research on it could provide important insights into the theoretical mechanism that underpins our diverse findings.

Further, studies of online reviews and eWOM that use ELM have focused on message quality but have generally overlooked other review characteristics, though Cheung et al. (2012), who explore review consistency and sidedness in addition to argument quality, represent an exception. Future studies should explore other review characteristics that may either affect perceptions of quality or those of credibility respectively to deepen our understanding about what review characteristics trigger these two respective routes of information processing. In this context, exploring the interaction among review characteristics may also offer interesting insights, such as exploring if the role of particular review characteristics (e.g., sidedness or consistency) are more important for certain types of reviews (e.g., positive versus negative).

Finally, on a more practical level, future research should explore interaction effects between characteristics of the review and those of the property being review (e.g., hotel star ratings) to see if particular review characteristics are more salient for specific types of properties (e.g., luxury properties). Along the same lines, an interesting area to explore would involve the interaction effect between brand familiarity and review characteristics (e.g., unknown or less-known properties versus those from a major franchise, such as Hilton or Four Seasons, may experience greater impact due to online reviews). Examining such an interaction would bring in an important aspect of brand context that eWOM and online review studies have generally overlooked.

7.2   Practical Implications

From a practical viewpoint, this study provides marketers with a comprehensive framework for understanding the antecedents and consequents of information usefulness and the moderating role of review valence on the overall relationships between these antecedents and consequents.

By revealing the moderating role of valence, our findings suggest that techniques employed to instill more favorable brand attitudes should be sensitive to the fact that consumers may develop their perceptions of information usefulness in different ways and that they, in turn, may have different effects on behavioral intentions toward the brand. Hence, these findings demonstrate the need for brand communicators to customize their responses to consumers depending on their prior exposure to reviews (O'Connor, 2010).

In addition, and leveraging the findings of this study, marketing managers can now develop informed crisis-management protocols in regards to online reviews about their brands. Specifically, they should address recent, detailed reviews rather promptly (especially but not exclusively those reviews that active contributors submit); failing to do so may lead to lost business given the chain of consequences that we have identified. On the opposite end, and in the event that marketers have limited resources to monitor and act on online reviews, our findings suggest that they should engage with those individuals who actively contribute positive reviews, because their assessments will likely influence the decisions of brand prospects. Marketers' contributions to positive reviews may also lead to the solicitation of additional positive reviews in the future and, thus, create additional value for the brand.

7.3   Limitations

Our study has several limitations that primarily pertain to the limited generalizability of the findings given the specific experimental design and the scenario used in it. Our scenario-based experiment focused on a hotel (as opposed to other property types, such as restaurants), the tourism sector (as opposed to other domain areas of eWOM), business travel (as opposed to personal travel), and on the TripAdvisor platform specifically. In particular, the platform introduces biases with respect to the type of review characteristics that one can manipulate and study. For instance, reviewer credibility is a prominent feature on the TripAdvisor platform but may not be equally prominent in other booking or online shopping websites.

Second, our sample mostly included college students; hence, the relative importance of review characteristics may change due to respondents' demographics, which we controlled for in our sample.

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Appendix A: Complete Scales for all Model Constructs

Table A1. Instrument

Construct	All Items (7-point Likert anchored from "strongly disagree" to "strongly agree" unless otherwise indicated)	Adapted from
Review currency*	"The reviews are current." "The reviews are timely." "The reviews are up to date."	Wixom & Todd (2005)
Review accuracy*	"Information provided is accurate." "Information provided is correct." "Information provided is reliable."	Wixom & Todd (2005)
Reviewer credibility	"The person who wrote the review was knowledgeable in evaluating the hotel." "The person who wrote the review was trustworthy in evaluating the hotel." "The person who wrote the review was credible in evaluating the hotel." "The person who wrote the review appeared to be an expert in evaluating the hotel."	Bhattacherjee & Stanford (2006)
Review usefulness	"The information provided is valuable." "The information provided is informative." "The information provided is helpful."	Bailey & Pearson (1983)
Brand attitude	*(Measured on seven-point Likert scale that ranged from negative to positive)* "Overall my impression of this hotel is…" "The image I have of this hotel is…" "How do you feel about this hotel?" "I would consider staying in this hotel."	Adapted from Lee et al. (2010)
Booking intention	"If I needed a hotel room in the near future, I would consider reserving one from this hotel." "If I needed a hotel room in the near future, I would reserve one from this hotel." "If I needed a hotel room in the near future, I would expect to reserve one from this hotel." "If I needed a hotel room in the near future and if this room was competitively priced, I would consider reserving one from this hotel."	Everard & Galletta (2005)
* We used review currency and accuracy as first-order constructs underpinning review quality (second-order).		

About the Authors

Constantinos K. Coursaris is a seasoned researcher and practitioner with over 15 years of experience in the scientific study and enablement of new media users in commercial, academic, and government environments. He is recognized as an expert in Information and Communication Technology (and specifically, human-computer interaction, usable website design, user experience testing methodologies, user-centered design, mobile commerce, social media) and Entrepreneurship. He has been consulted on Web content management, Website development, business start-ups, digital marketing and social media strategies; partners/clients have included for-profit organizations (in energy, automotive, construction, advertising), NGOs, politicians, activists in the Middle East and North Africa, and the United Nations Development Program. His research has been focused on health and marketing communication and has been supported by multiple funding sources including the U.S. Department of Agriculture, Michigan Department of Community Health (MDCH), McKesson Foundation, Patient-Centered Outcomes Research Initiative, Leo Burnett Detroit, and others. Connect with him @DrCoursaris.

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