
Article:
Banerjee, Snehasish orcid.org/0000-0001-6355-0470 and Chua, Alton Y.K. (2021) Calling out fake online reviews through robust epistemic belief. Information & management. 103445. pp. 1-13. ISSN 0378-7206

https://doi.org/10.1016/j.im.2021.103445

Calling out fake online reviews through robust epistemic belief

Abstract: Research shows that computational algorithms can classify online reviews as authentic or fake based on linguistic nuances. This study examines whether Internet users can process reviews in an algorithmic manner to discern authenticity. It also considers the role of epistemic belief—the individual trait that inherently determines one's ability to separate fact from falsehood. In an online survey, 380 participants were each exposed to three hotel reviews—some authentic, others fake. Perceived specificity was positively related to perceived review authenticity, whereas perceived exaggeration showed a negative association. Epistemic belief with respect to justification for knowing significantly moderated both the relationships.

Keywords: authenticity; e-tourism; information processing; online review; fake review; epistemic belief.

1. Introduction

As a popular form of user-generated content, online reviews have mushroomed rapidly over the past decade. Instead of relying solely on organizations to dish out marketing information about products and services, Internet users are now able to gain insights from a plethora of reviews contributed by others in the online community (Filieri et al., 2018; Torres et al., 2015). Unfortunately, the problem of fake reviews has also surfaced in recent years. Unlike authentic reviews that describe post-purchase experiences, fake reviews contain figments of imagination (Banerjee et al., 2017). But because they are deceitfully crafted to appear genuine, telling an authentic review from a fake one is difficult for users (Bond & DePaulo, 2006; Ott et al., 2011; Plotkina et al., 2020; Porter & ten Brinke, 2010). The challenge is particularly compounded when users are not epistemologically alert (Hofer, 2004; Sperber et al., 2010), and take everything they read online at its face value. Fake reviews thus impair users' purchase decisions, and distort the reputation of businesses (Ott et al., 2011; Plotkina et al., 2020).

In tackling this problem, previous research has confirmed the ability of computational algorithms to distinguish between authentic and fake reviews with reasonable accuracy (Harris, 2012; Ott et al., 2011). These algorithms often look for linguistic cues related to whether reviews are easy to read, rich in details, use superlatives, and appear noncommittal (Banerjee & Chua, 2017; DePaulo et al., 2003; Tausczik & Pennebaker, 2010). However, the extent to which review websites make use of such algorithms proposed by the scholarly community to weed out fake reviews is never publicly disclosed. Even when algorithms are leveraged, they cannot be assumed to be foolproof, and hence some fake reviews are bound to slip through the cracks (Ott et al., 2012; Prasad et al., 2017).

Meanwhile, research has also shown that users are sensitive to the language in reviews (Baker & Kim, 2019; Cox et al., 2017; Salehan & Kim, 2016). They are particularly

recommended to watch out for suspicious language (Hill, 2018). Hence, if users are epistemologically alert online and are able to scrutinize the text in reviews in an algorithmic manner, they stand a good chance to spot fake reviews. However, research has yet to investigate the possibility of leveraging linguistic cues used in computational algorithms through human efforts. Studies on users' perceptions of review authenticity are also far and few.

For these reasons, this study investigates the extent to which users are able to judge review authenticity by identifying linguistic nuances used commonly in computational algorithms. In particular, the linguistics nuances are comprehensibility, specificity, exaggeration, and tentativeness. To delve deeper, it takes into consideration the role of epistemic belief—the individual trait that is inherently linked to one's ability to sieve out fact from falsehood (Hofer, 2004).

To accomplish the objectives, a convergent parallel mixed methods research design was employed. Such a design allows researchers to collect quantitative as well as qualitative data roughly at the same time, and thereafter integrate the two forms of data in the overall interpretation of the results (Creswell, 2014). In particular, a survey was conducted to collect both quantitative and qualitative data about users' perceptions of reviews. The purpose was to facilitate a more robust analysis than what a quantitative or a qualitative approach alone would have afforded (Campbell & Fiske, 1959; Creswell, 2014).

This article contributes to the growing body of literature on the effect of online reviews' language on users' perceptions (e.g., Baker & Kim, 2019; Salehan & Kim, 2016). Besides, it represents the earliest attempt to offer empirical evidence of whether users with robust epistemic belief are necessarily better than those who are naive in ascertaining review authenticity. Methodologically, this article extends previous works in this area (e.g., Banerjee et al., 2017) by employing a convergent parallel mixed methods research design (Creswell,

2014). Collecting both quantitative and qualitative data under the framework of a survey, and then analyzing nuances between the two forms of data allow a greater scope for triangulation.

2. Literature Review and Research Hypotheses

2.1. Related Works and Research Questions

This study is based on the premise that users are sensitive to linguistic nuances in online reviews (Baker & Kim, 2019; Cox et al., 2017; Salehan & Kim, 2016). In theory, if they inspect the language in reviews in an algorithmic fashion, they should be able to distinguish between what is genuine and what is fictitious. In practice, however, humans fare poorly in identifying information authenticity. The ways in which they label information as either fact or falsehood resembles random guessing (Bond & DePaulo, 2006; Porter & ten Brinke, 2010; Van Swol et al., 2015).

According to the literature on deception detection (Burgoon et al., 2005; Fiedler & Walka, 1993), the reason is that humans rely on heuristics to discern authenticity. Their mental shortcuts bias their judgments of the incoming information. The two extreme ends of the bias include truth bias and deception bias, neither of which is healthy in the online setting (Burgoon et al., 2005). Truth-biased individuals judge all information as authentic, and hence can be easily taken in by falsehood. In contrast, deception-biased individuals judge all information as fake, and hence can gain nothing from the reservoir of online facts. The theory of truth bias could be brought to bear in this context. It posits that truth bias is the default setting (Vrij & Baxter, 1999). Individuals tend to perceive most reviews as being true rather than false (Levine et al., 2010; Plotkina et al., 2020).

While both truth bias and deception bias are counter-productive, being epistemically vigilant gives users the handle to pick up questionable aspects of a text, and be in a better position to distinguish between fact and falsehood. In this vein, the notion of epistemic

vigilance suggests that if individuals are vigilant toward the textual content of reviews, they should be able to identify linguistic nuances in the incoming information (Sperber et al., 2010). This in turn should enable them to distinguish between authentic and fake reviews (Salehan & Kim, 2016). In that case, perceived linguistic cues should be related to perceived review authenticity.

Therefore, this research seeks to address the following research question (RQ1): How are perceived linguistic cues related to perceived review authenticity?

To further understand the relation between perceived linguistic cues and perceived review authenticity, the personal epistemology framework could be leveraged. It conceptualizes individuals' epistemic belief along two facets: perceived reliability of knowledge and perceived justification for knowing. These influence individuals' perception of authenticity (Hofer, 2004; Hofer and Pintrich, 1997).

Individuals consider the reliability of knowledge on a well-defined-versus-fuzzy scale, and the justification for knowing on an intuition-versus-inquiry continuum. These considerations influence individuals' perceived authenticity by shaping their level of epistemic vigilance, which, in turn, might have an impact on their susceptibility to truth bias (Hofer, 2004; Sperber et al., 2010). However, the question of whether epistemic belief moderates the relationship between perceived linguistic cues and perceived review authenticity remains open.

Bearing the foregoing, this research also seeks to address the following research question (RQ2): How does epistemic belief moderate the relationship between perceived linguistic cues and perceived review authenticity?

2.2. Conceptual Framework and Hypotheses Development

According to the information manipulation theory (McCornack, 1992), authentic and fake reviews should be distinguishable based on quantity, manner, quality, and relevance. Quantity refers to wordiness, while manner reflects writing style. Both determine comprehensibility, the degree to which reviews are easy to read. Besides, quality measures the level of details, while relation refers to information relevance. Both determine specificity, the extent to which reviews are rich in details.

Furthermore, the leakage theory (Ekman & Friesen, 1969) suggests that although writers of both authentic and fake reviews would strive to sound convincing, the latter are more likely to go overboard. They will inadvertently show signs of exaggeration by using over-the-top superlatives. The theory also argues that writers of fake reviews would be circumspect while constructing their sentences. Hence, they will use words such as "perhaps" and "guess" that are noncommittal, and are inclined toward being tentative.

Together, the two theories help identify the following four linguistic cues that users could use to distinguish between authentic and fake reviews: comprehensibility, specificity, exaggeration, and tentativeness. Perceived comprehensibility measures the extent to which a review is easy to read (Berger & Iyengar, 2013; Galante & Thomson, 2017). Easy-to-read reviews conceivably aid sense-making. Perceived specificity measures the extent to which a review is rich in details (Bond & DePaulo, 2006). It is the attribute that makes the review informative. Perceived exaggeration measures the extent to which a review goes overboard in using over-the-top superlatives (Chan, 2004; Hu et al., 2012). It is indicative of the review writer's attempt to be persuasive. Perceived tentativeness measures the extent to which a review appears noncommittal (Banerjee & Chua, 2017; Ekman & Friesen, 1969). Reviews that are circumspect convey uncertainty.

With the cyberspace being constantly plagued by fake news, it pays to be more cautious—in other words, epistemologically vigilant—when reading online reviews. Hence, users could curb their truth bias instincts. And if they are sufficiently vigilant, they should be able to discern review authenticity based on their perceptions of these four linguistic cues. In particular, they could look out for reviews that are comprehensible and specific (Papathanassis & Knolle, 2011; Schrank et al., 2010), and be wary of those that are exaggerated or tentative (Connors et al., 2011; Porter et al., 2012). Hence, the following four hypotheses are posited to help address RQ1:

H1: Perceived comprehensibility is positively related to perceived review authenticity.

H2: Perceived specificity is positively related to perceived review authenticity.

H3: Perceived exaggeration is negatively related to perceived review authenticity.

H4: Perceived tentativeness is negatively related to perceived review authenticity.

Based on epistemic belief, individuals lie on a continuum from being epistemologically naive to epistemologically robust (Bråten et al., 2005; Hofer, 2004). Epistemologically naive individuals consider the reliability of knowledge to be relatively well-defined. For them, justification about the process of knowing is possible simply through intuition. Given their simplistic information-processing worldview, they underestimate the challenges involved in evaluating information authenticity.

In contrast, epistemologically robust individuals believe that the reliability of knowledge is largely fuzzy. The process of knowing requires arduous efforts for justification. They value rigor and tend to be cautious in assessing information authenticity.

All else being equal, epistemologically naive users are more likely to let down their guard in reading reviews compared with epistemologically robust individuals. The inadequate epistemic vigilance among the former could manifest in two possible ways. First, they would not be able to identify cues that are supposed to offer hints about review authenticity. Their

perception that the reliability of knowledge is well-defined would entice them to take the authenticity of reviews for granted. Second, even if they manage to identify, they would not be able to leverage the cues rigorously in their decision-making. After all, they believe in intuition rather than rigorous rules of inquiry to justify their process of knowing (Hofer, 2004).

In sum, the odds are high for epistemologically naive users to falter at one or both the precursors to discerning review authenticity. In contrast, epistemologically robust users are better poised to identify cues, and leverage them rigorously to judge review authenticity. They could be vigilant in reading reviews, and hence, are likely to be sensitive to the use of language in reviews.

Therefore, epistemic belief has the potential to exert a moderating effect on the relationship between perceived linguistic cues and perceived authenticity. In particular, the relations are likely to be stronger for epistemologically robust users vis-à-vis epistemologically naive individuals. Hence, the following is posited to help address RQ2:

H5: Epistemic belief moderates the relations between perceived linguistic cues—(a) comprehensibility, (b) specificity, (c) exaggeration, (d) tentativeness—and perceived review authenticity.

Figure 1 depicts the conceptual framework. With perceived authenticity as the dependent variable, the independent variables include perceived comprehensibility (H1), perceived specificity (H2), perceived exaggeration (H3), and perceived tentativeness (H4). Epistemic belief serves as the moderator (H5).

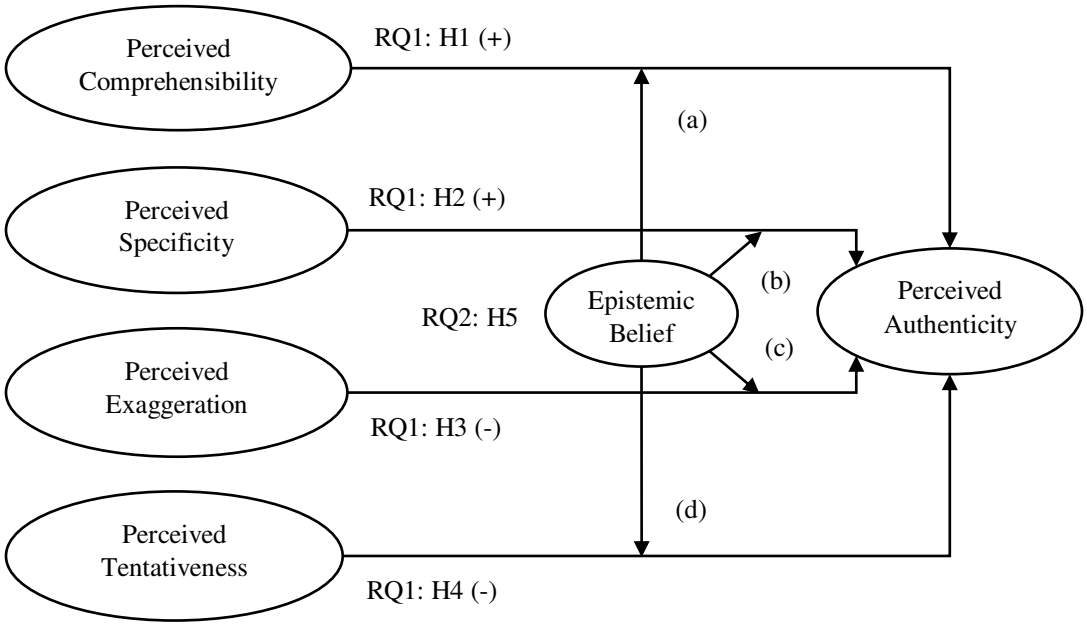


Figure 1: Conceptual framework.

3. Methods

This study uses reviews for hotels as the test case for investigation. Reviews have been extremely impactful in the hotel industry, mainly due to its experiential nature (Chan et al., 2017; Xie et al., 2011). Hotel reviews are read by a staggering 98% of users. Moreover, about 78% of users depend on reviews to decide where to stay (Prashar, 2016).

A convergent parallel mixed methods survey was conducted. The survey questionnaire included both close-ended and open-ended questions to obtain quantitative as well as qualitative data respectively. The former and the latter provide different types of information, which when viewed together paints a more holistic picture of the research problem than what either of the two alone would have afforded. This is rooted in the seminal multitrait–multimethod approach (Campbell & Fiske, 1959; Creswell, 2014).

The survey was conducted online, and exposed participants to three reviews. In particular, three reviews were chosen because Internet users read about three reviews on

average prior to making decisions (Bambauer-Sachse & Mangold, 2011, 2013). In fact, exposing participants to three reviews in a research setting is a commonly employed methodological strategy (Connors et al., 2011; Dai et al., 2019; Furner et al., 2016; Hamby et al., 2015). It helps control for the cognitive load of participants.

Of the three reviews shown to participants, either two were authentic and one was fake, or one authentic and the other two fake. For this purpose, the set of 54 hotel reviews (27 algorithmically verified to be authentic + 27 algorithmically verified to be fake) previously subjected to human evaluation in the experiment designed by Banerjee et al. (2017) was used. The authentic reviews came through verified bookings, whereas individuals in a research setting wrote the fake ones. The authenticity of these reviews was successfully detected by machine learning algorithms in terms of the linguistic cues of comprehensibility, specificity, exaggeration, and tentativeness. Moreover, the reviews contained neither any brand references nor any cultural references. This allowed controlling for participants' preferences and predispositions.

Uniformly distributed across positive, negative and moderate polarities as well as luxury, budget, and mid-range hotels (Table 1); the reviews in the corpus were structured as titles and descriptions. Participants' perceptions of reviews were captured using a questionnaire that sought close-ended and open-ended responses. Analytical approaches included partial least squares and exploratory content analysis. The methods are explained in greater details below.

Table 1: Hotel reviews from Banerjee et al. (2017).

Hotel Categories	Review Polarities	# Reviews
Luxury	Positive	6 reviews (3 Authentic + 3 Fake)
	Negative	6 reviews (3 Authentic 3 Fake)
	Moderate	6 reviews (3 Authentic + 3 Fake)
Budget	Positive	6 reviews (3 Authentic + 3 Fake)
	Negative	6 reviews (3 Authentic + 3 Fake)
	Moderate	6 reviews (3 Authentic + 3 Fake)
Mid-range	Positive	6 reviews (3 Authentic + 3 Fake)
	Negative	6 reviews (3 Authentic + 3 Fake)
	Moderate	6 reviews (3 Authentic + 3 Fake)
Total		**54 reviews (27 Authentic + 27 Fake)**

3.1. Survey Stimuli and Procedure

A simulated review website LoveToTravel.com was designed, showing reviews for Three2One Hotel. Details of the hotel included a location and a description. The location was indicated as Hong Kong, a popular tourist destination in Asia. The description contained phrases such as “stylish accommodation” when instantiated as a luxury hotel (Figure 2), those such as “no-frills accommodation” when instantiated as a budget hotel (Figure 3), and those such as “comfortable accommodation” when instantiated as a mid-range hotel (Figure 4).

Consistent with the design of contemporary review websites, ratings and titles of reviews were presented more conspicuously than descriptions (Ludwig et al., 2013). As discussed earlier, participants were shown three reviews because users read about three entries on average for decision-making (Bambauer-Sachse & Mangold, 2013).

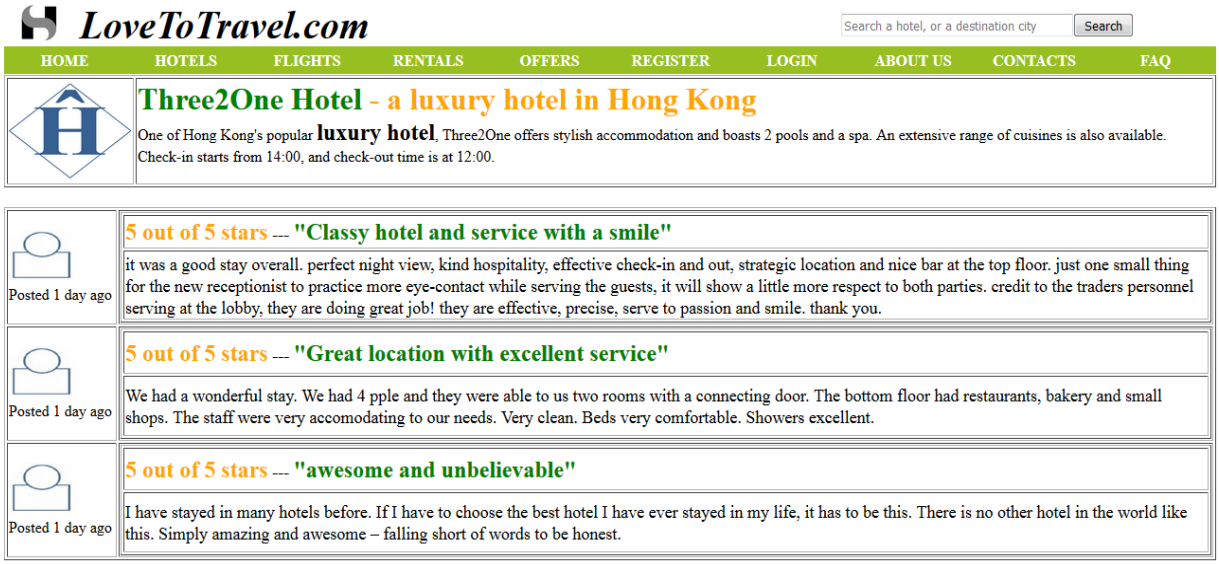


Figure 2: A LoveToTravel.com version showing positive reviews for luxury hotel.

Figure 3: A LoveToTravel.com version showing negative reviews for budget hotel.

Figure 4: A LoveToTravel.com version showing moderate reviews for mid-range hotel.

The reviews were split into 18 sets to set up the arrangement of three reviews per participant (18 sets x 3 reviews = 54 reviews). These were included on 18 different versions of LoveToTravel.com with three reviews each. To control for order effects (Chang, 2016), the 18 versions of LoveToTravel.com were unique in terms of hotel categories, review polarities as well as sequence of authentic and fake reviews (Table 2).

Table 2: Distribution of reviews across versions of LoveToTravel.com.

Hotel Categories	Review Polarities	# Reviews[1]	Website Versions	Sequence[1]
Luxury	Positive	6 reviews (3A + 3F)	1	AAF
			2	FFA
Luxury	Negative	6 reviews (3A + 3F)	3	AFA
			4	FAF
Luxury	Moderate	6 reviews (3A + 3F)	5	FAA
			6	AFF
Budget	Positive	6 reviews (3A + 3F)	7	FAA
			8	AFF
Budget	Negative	6 reviews (3A + 3F)	9	AAF
			10	FFA
Budget	Moderate	6 reviews (3A + 3F)	11	AFA
			12	FAF
Mid-range	Positive	6 reviews (3A + 3F)	13	AFA
			14	FAF
Mid-range	Negative	6 reviews (3A + 3F)	15	FAA
			16	AFF
Mid-range	Moderate	6 reviews (3A + 3F)	17	AAF
			18	FFA

Note. [1] A and F denote authentic and fake reviews respectively. Three pairs of review sequences were used: AAF-FFA, AFA-FAF, and FAA-AFF. Each pair was used once for each of the three hotel categories—luxury, budget, and mid-range—as well as once for each of three review polarities—positive, negative, and moderate. This ensured that the 18 versions of LoveToTravel.com were unique in terms of hotel categories, review polarities as well as sequence of authentic and fake reviews.

Participants were recruited using purposive sampling. The study invitation was disseminated through an advertisement posted on notice boards inside the campus of a large public university, and on the researchers' online social networks. Two inclusion criteria were imposed. First, individuals must be minimally undergraduate students in terms of their educational profile. After all, hotel reviews are mostly read by educated individuals, especially those who have completed secondary/high school (Gretzel et al., 2007; Ip et al., 2012). Second, individuals must have relied on reviews to book hotels in the last year. This ensured that they were appropriate for the task at hand.

After obtaining informed consent, the survey procedure included five steps. First, each participant was randomly assigned to one of the 18 versions of LoveToTravel.com. Participants were given the necessary URL via email. They were promised a monetary incentive.

Second, participants were asked to imagine visiting a hotel review website to evaluate a hotel prior to booking for their forthcoming trip. They were introduced to the assigned version of LoveToTravel.com, and Three2One Hotel in Hong Kong. Participants were instructed to assume that it was a relevant and affordable accommodation choice for their trip. This allowed controlling for participants' preferences and budget constraints (Papathanassis & Knolle, 2011).

Third, participants were asked to carefully read the three reviews. To heighten suspicion, they were told that at least one of the reviews was fake. Taking the cue from prior works (Reips, 2002), they were requested to pay undivided attention during participation given the difficulty in distinguishing between authentic and fake reviews. To further motivate them to perform well in the task, they were informed that that they could receive additional monetary incentive if they were able to predict the authenticity of all the three reviews accurately. This strategy was informed by the literature as a way to motivate sincerity among participants (Blair et al., 2010; George et al., 2014). In reality however, all participants were supposed to receive the additional monetary incentive regardless of their responses.

Fourth, participants were required to answer a questionnaire (Section 3.2). It captured participants' perceptions of reviews along with individual differences.

Finally, participants were debriefed. The debriefing statement clarified that they were promised additional incentives only to heighten their vigilance (Blair et al., 2010; George et al., 2014). In reality however, all participants received the amount that they were promised had they predicted the authenticity of all the three reviews correctly.

3.2. Questionnaire

The questionnaire (Table 3) comprised two segments. The first included items to measure participants' perceptions of reviews both quantitatively (1 = Strongly Disagree, 5 =

Strongly Agree) and qualitatively. The second segment included items to measure individual differences. Apart from capturing epistemic belief and demographic details, participants' Internet anxiety, familiarity with review websites, and attitude toward hotel reviews were also obtained. This was because these variables have served as useful control variables in related works (Kwon & Sung, 2012; Qiu et al., 2012).

Given that reviews were structured as titles and descriptions, perceived linguistic cues had to be traced for the two components separately (De Ascaniis & Gretzel, 2012). This called for operationalizing perceived comprehensibility, perceived specificity, perceived exaggeration, and perceived tentativeness as formative constructs (Wixom & Watson, 2001). All other quantitatively measured constructs were reflective. The questionnaire items to measure perceived comprehensibility, perceived specificity, perceived exaggeration, and perceived tentativeness were developed by the researchers based on literature review, and assessed through pre-tests using two-step Q-sorting (Petter et al., 2007). Those to measure perceived authenticity were guided by works such as Blair et al. (2010) and Kim et al. (2015). Epistemic belief was measured using the extant scale (Bråten et al., 2005; Hofer, 2004; Hofer & Pintrich, 1997). The items to measure the control variables of Internet anxiety, website familiarity, and attitude were adapted from McKnight and Kacmar (2006), Blanco et al. (2010), and Park et al. (2007) respectively.

Table 3: Constructs along with their questionnaire items.

Constructs	Questionnaire Items
Perceived comprehensibility (formative construct)	**PCom1:** The title of the review is easy to read. **PCom2:** The description of the review is easy to read.
Perceived specificity (formative construct)	**PSpe1:** The title of the review is informative. **PSpe2:** The description of the review is informative.
Perceived exaggeration (formative construct)	**PExa1:** The title of the review is exaggerated. **PExa2:** The description of the review is exaggerated.
Perceived tentativeness (formative construct)	**PTen1:** The title of the review appears tentative. **PTen2:** The description of the review appears tentative.
Perceived authenticity (reflective construct)	**PA1:** The review is a genuine account of post-trip experience. **PA2:** The review is written after a stay in the hotel. **PA3:** The review is an honest description of a stay in the hotel.
Open-ended	**Qualitative:** Do you think the review is authentic? [yes/no radio button] Why?
Epistemic belief: Perceived reliability of knowledge (reflective construct)	**EpiR1:** Online reviews on the Internet reflect accurate knowledge about hotels. **EpiR2:** Online reviews provide me with most of the knowledge I need to select a hotel. **EpiR3:** Correct information about hotels can be found in online reviews. **EpiR4:** In online reviews, the richness of detail about hotels is most prominent. **EpiR5:** Online reviews provide correct information about hotels. **EpiR6:** The most important aspect of online reviews is that they contain specific facts about hotels. **EpiR7:** I am most confident that I have selected the appropriate hotel when I have used online reviews as the source of information. **EpiR8:** Most of what is true about hotels are available in online reviews. **EpiR9:** Online reviews contain concrete information about hotels. **EpiR10:** The strength of online reviews is the vast amount of detailed information available about hotels. **EpiR11:** Correct evaluation of hotels is available in online reviews.
Epistemic belief: Perceived justification for knowing (reflective construct)	**EpiJ1:** To check the credibility of hotel-related information available in online reviews, I try to compare multiple sources. (R) **EpiJ2:** I check if the hotel-related information available in online reviews is logical. (R) **EpiJ3:** To check if the hotel-related information available in online reviews is reliable, I evaluate it in relation to other knowledge I have. (R) **EpiJ4:** I evaluate hotel-related information available in online reviews by checking more sources. (R)
Internet anxiety (reflective construct)	**Anx1:** I hesitate to use the Internet for fear of making mistakes. **Anx2:** I avoid the Internet because it is intimidating to me.
Website familiarity (reflective construct)	**Fam1:** I am familiar with the use of review websites such as Amazon.com and TripAdvisor.com. **Fam2:** I visit review websites such as Amazon.com and TripAdvisor.com.
Attitude toward reviews (reflective construct)	**Att1:** I generally like reading online reviews for hotels. **Att2:** I generally find it interesting to read online reviews for hotels.

Note. (R) indicates reverse-coded items.

3.3. Analytical Approaches

Quantitative analysis. The quantitative data analysis involved structural equation modeling (SEM). Compared with covariance-based SEM, partial least squares SEM is better suited to deal with formative constructs (Choudhury & Karahanna, 2008), and hence, used in this study.

To address RQ1 (test H1-H4), path coefficients were examined. The bootstrap procedure with 5,000 resamples was employed to determine the significance of the path coefficients. To address RQ2 (test H5), the moderating effect of epistemic belief was tested through multi-group SEM.

As highlighted earlier, epistemic belief comprises disparate facets: perceived reliability of knowledge and perceived justification for knowing (Hofer, 2004). With respect to the former, the participants were categorized as either naive or robust according to the arithmetic mean of their aggregated responses to the questionnaire items EpiR1 to EpiR11 (Table 3). With respect to the latter, the participants were categorized according to the arithmetic mean of their aggregated responses to EpiJ1 to EpiJ4 (Table 3). Individuals within ± ½ standard deviation around the mean were eliminated (Rodríguez et al., 2008).

The SEM was conducted using SmartPLS (Ringle et al., 2005). The unit of analysis was participants' responses per review. Participants' age group, gender, educational/employment status, sequence of review (dummy-coded 1, 2 or 3), Internet anxiety, familiarity with review websites, and attitude toward reviews as well as the website versions to which individuals were assigned were controlled. No control variable emerged significant. Hence, they are not reported for brevity.

Qualitative analysis. In addition, exploratory content analysis was employed on the open-ended responses provided by the 380 participants about each of the three reviews. There could be a maximum of 1,140 responses (380 participants x 3 reviews). Of these, 22 were irrelevant (e.g., "."), and hence, eliminated. The remaining 1,118 responses (1140 - 22) were qualitatively analyzed.

For this purpose, three independent coders were recruited. The analysis procedure involved three steps. First, the coders conducted a line-by-line scrutiny of the responses to generate themes inductively. Owing to the interpretative nature of such an analysis, the

researcher allowed the coders to annotate a single statement into multiple codes where necessary.

Second, the coders along with one of the researchers examined the open-ended responses in face-to-face meetings. The themes were constantly compared against one another to ascertain inter-relationships. Similar themes were collapsed (Papathanassis & Knolle, 2011; Saldaña, 2015; Strauss & Corbin, 1998). To confirm the nature of the themes, a coding scheme was developed (Table 4). After looking through the first 150 responses, inter-coder agreement for each category was found to be acceptable (Cohen's Kappa > 0.77). Disagreements were resolved through discussion (Wu, 2019).

Table 4: Coding scheme for the qualitative analysis.

Strategies	**Coding Procedure**	**Examples**
Comprehensibility	Responses were coded as comprehensibility-related when they focused on the ease with which reviews could be read or understood.	"too many grammatical errors" (participant 236)
Specificity	Responses were coded as specificity-related when they focused on the informativeness or the richness of specific details in reviews.	"good details provided" (participant 258)
Exaggeration	Responses were coded as exaggeration-related when they focused on the extent to which reviews used superlatives, or went overboard to appear convincing.	"too much exaggerated" (participant 136)
Conflicting information	Responses were coded as conflicting information-related when they focused on inconsistencies in the available information.	"title matched the description" (participant 258)
Intuition	Responses were coded as intuition-related when they focused on gut feeling or instincts.	"seems normal" (participant 28)

In the final step, the coders used the coding scheme to code all the open-ended responses using a more confirmatory approach compared with the previous steps. The purpose was not only to confirm the identified themes but also to look for any other themes that might have been overlooked. This was especially important given the explorative nature of the analysis that prevented the use of an a priori codebook (Papathanassis & Knolle, 2011).

4. Results

4.1. Sample and Descriptive Statistics

Responses were obtained from 380 participants, while 93 others did not complete the survey. Table 5 shows the distribution of the participants across the 18 versions of LoveToTravel.com. Table 6 summarizes their demographic details.

Table 5: Distribution of participants across versions of LoveToTravel.com.

Website Versions	Total Participants	Incomplete Responses	Complete Responses
1	24	6	18
2	21	4	17
3	28	8	20
4	26	5	21
5	19	3	16
6	27	4	23
7	22	5	17
8	27	5	22
9	29	7	22
10	26	5	21
11	31	5	26
12	28	4	24
13	25	5	20
14	29	4	25
15	27	4	23
16	31	4	27
17	31	9	22
18	22	6	16
Total	473	93	380

Table 6: Demographic details of the participants.

	Frequency	Percentage	Cumulative
Gender			
Male	214	56.31%	214 (56.31%)
Female	166	43.69%	380 (100%)
Age group			
21-25 years	225	59.21%	225 (59.21%)
26-35 years	137	36.05%	362 (95.26%)
36-45 years	18	4.74%	380 (100%)
Educational/Employment status			
Student pursuing Bachelor's degrees	143	37.63%	143 (37.63%)
Student pursuing Master's degrees	63	16.58%	206 (54.21%)
Student pursuing Doctoral degrees	37	9.74%	243 (63.95%)
Working adult with Bachelor's degrees	56	14.74%	299 (78.69%)
Working adult with Master's degrees	65	17.10%	364 (95.79%)
Working adult with Doctoral degrees	16	4.21%	380 (100%)
Nationality			
Singaporean	150	39.47%	150 (39.47%)
Indian	96	25.26%	246 (64.73%)
Chinese	54	14.21%	300 (78.94%)
Others	80	21.05%	380 (100%)

Note. N = 380.

Each of the 380 participants was shown three reviews. This meant that reviews were evaluated 1,140 times (380 x 3 = 1140). Across these evaluations, the participants were 68.44% accurate in identifying authentic reviews, and 43.06% accurate in identifying fake entries. The higher accuracy for authentic reviews vis-à-vis fake reviews suggests that truth bias made its presence felt (Vrij & Baxter, 1999).

The overall accuracy was 55.61%. This is consistent with the nearly axiomatic finding in the literature that human ability to detect deception resembles random guessing (Bond & DePaulo, 2006; Porter & ten Brinke, 2010). Nonetheless, the participants' performance was marginally above chance (50%) probably because they were told that at least one of the three reviews was fake.

4.2. Measurement Evaluation

Table 7 reports the results of evaluating the formative constructs. Variance inflation factors were below 3.3, confirming no multicollinearity (Diamantopoulos & Siguaw, 2006).

Item weightings had coefficients greater than 0.10, highlighting their relevance (Diamantopoulos & Winklhofer, 2001; Urbach & Ahlemann, 2010).

Table 7: Evaluation of the formative constructs.

Constructs	Items	VIF	Weightings
Perceived comprehensibility	PCom1	1.51	0.14
	PCom2	1.60	0.92
Perceived specificity	PSpe1	1.55	0.12
	PSpe2	1.75	0.93
Perceived exaggeration	PExa1	1.53	0.19
	PExa2	1.69	0.88
Perceived tentativeness	PTen1	1.53	0.21
	PTen2	1.72	1.14

Table 8 reports the results of evaluating the reflective constructs. Adequate reliability was evident from Cronbach's alpha (α) exceeding 0.70 (Nunnally, 1978), and composite reliability (CR) exceeding 0.65 (Steenkamp & Geyskens, 2006). Average variance extracted (AVE) exceeded 0.40, suggesting convergent validity (Verhoef et al., 2002). Moreover, square roots of AVE for all the constructs exceeded their correlations with other constructs, confirming discriminant validity (Fornell & Larcker, 1981). Table 9 shows the cross-loadings.

Table 8: Evaluation of the reflective constructs.

Constructs	α	CR	AVE	(1)	(2)	(3)	(4)	(5)	(6)
Perceived authenticity (1)	0.93	0.95	0.87	0.93					
Epistemic belief: Reliability (2)	0.89	0.91	0.48	0.15	0.69				
Epistemic belief: Justification (3)	0.83	0.89	0.67	-0.08	-0.21	0.82			
Internet anxiety (4)	0.85	0.93	0.87	-0.05	-0.19	0.35	0.93		
Website familiarity (5)	0.80	0.90	0.82	0.03	0.30	-0.31	-0.27	0.90	
Attitude toward reviews (6)	0.87	0.94	0.88	0.07	0.40	-0.22	-0.16	0.52	0.94

Note. Shaded cells at diagonals of the correlation matrix part of the table indicate square roots of AVE.

Table 9: Cross-loadings.

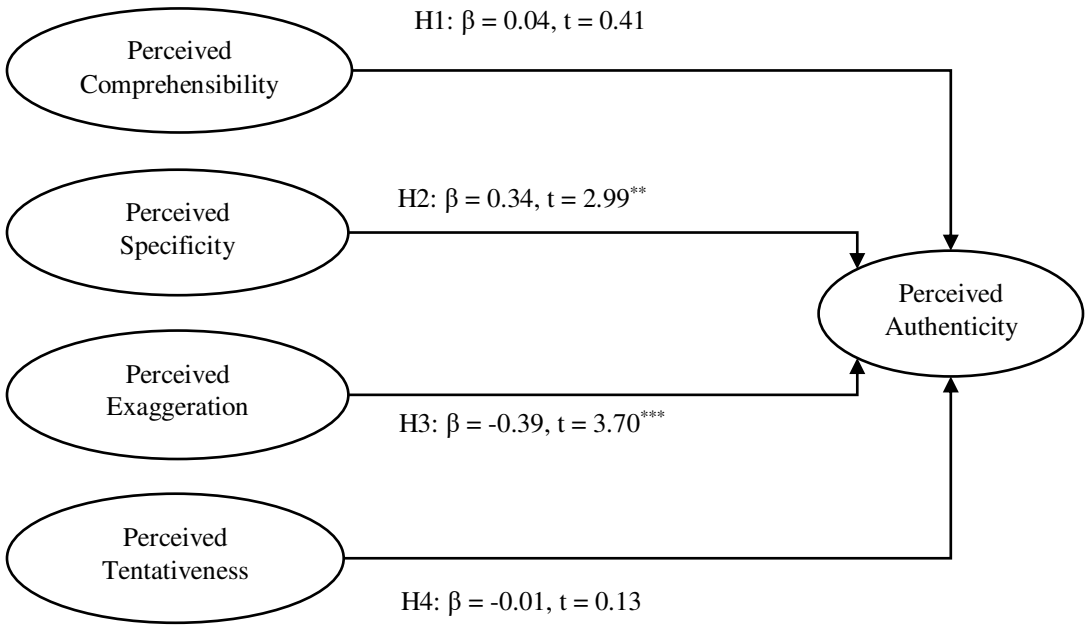
	PCom	PSpe	PExa	PTen	PA	EpiR	EpiJ	Anx	Fam	Att
PCom1	0.60	0.36	-0.06	-0.13	0.17	0.19	-0.32	-0.25	0.13	0.11
PCom2	0.99	0.49	-0.16	-0.13	0.28	0.16	-0.24	-0.16	0.08	0.13
PSpe1	0.34	0.61	-0.15	-0.10	0.28	0.16	-0.07	-0.03	0.05	0.14
PSpe2	0.50	0.99	-0.23	-0.19	0.46	0.14	-0.10	-0.08	0.06	0.07
PExa1	-0.12	-0.14	0.69	0.24	-0.33	-0.02	0.05	0.09	0.00	-0.04
PExa2	-0.16	-0.23	0.99	0.11	-0.47	-0.04	0.03	0.12	0.02	-0.04
PTen1	-0.10	-0.10	0.23	0.40	-0.09	0.02	0.05	0.08	-0.02	0.04
PTen2	-0.14	-0.19	0.41	0.98	-0.23	-0.02	0.06	0.20	-0.02	0.04
PA1	0.27	0.42	-0.44	-0.24	0.93	0.15	-0.07	-0.05	0.03	0.08
PA2	0.25	0.44	-0.40	-0.19	0.93	0.12	-0.08	-0.04	0.01	0.04
PA3	0.28	0.44	-0.49	-0.23	0.94	0.16	-0.07	-0.05	0.03	0.08
EpiR1	0.08	0.01	0.01	0.01	0.10	0.66	-0.10	-0.04	0.19	0.23
EpiR2	0.14	0.11	-0.03	0.02	0.12	0.69	-0.17	-0.18	0.20	0.36
EpiR3	0.16	0.12	-0.01	-0.02	0.12	0.79	-0.21	-0.17	0.32	0.32
EpiR4	0.13	0.08	-0.02	-0.05	0.11	0.61	-0.13	-0.18	0.16	0.22
EpiR5	0.07	0.09	-0.01	-0.01	0.10	0.73	-0.08	-0.09	0.23	0.26
EpiR6	0.18	0.14	-0.05	-0.08	0.13	0.66	-0.16	-0.20	0.12	0.30
EpiR7	0.11	0.10	-0.02	0.07	0.07	0.60	-0.09	-0.11	0.24	0.38
EpiR8	0.10	0.09	-0.04	0.00	0.10	0.68	-0.15	-0.06	0.18	0.25
EpiR9	0.07	0.08	-0.03	-0.02	0.11	0.73	-0.10	-0.03	0.20	0.22
EpiR10	0.13	0.08	-0.04	-0.03	0.10	0.63	-0.16	-0.17	0.13	0.20
EpiR11	0.13	0.11	-0.04	-0.04	0.10	0.78	-0.22	-0.19	0.30	0.31
EpiJ1	-0.22	-0.08	0.01	0.05	-0.07	-0.14	0.86	0.30	-0.26	-0.11
EpiJ2	-0.24	-0.11	0.00	0.06	-0.06	-0.18	0.82	0.29	-0.28	-0.18
EpiJ3	-0.18	-0.05	0.04	0.06	-0.06	-0.18	0.80	0.24	-0.28	-0.27
EpiJ4	-0.23	-0.09	0.04	0.02	-0.07	-0.19	0.78	0.30	0.22	-0.16
Anx1	-0.16	-0.09	0.11	0.17	-0.05	-0.16	0.28	0.93	-0.26	-0.13
Anx2	-0.17	-0.06	0.12	0.22	-0.05	-0.19	0.37	0.94	-0.25	-0.16
Fam1	0.13	0.06	0.01	-0.04	0.03	0.29	-0.34	-0.29	0.95	0.46
Fam2	0.03	0.06	0.03	0.01	0.02	0.25	-0.20	-0.18	0.87	0.52
Att1	0.12	0.08	-0.04	0.04	0.06	0.38	-0.22	-0.16	0.54	0.93
Att2	0.13	0.08	-0.04	0.02	0.08	0.37	-0.20	-0.14	0.45	0.95

Note. Shaded cells highlight the correlations between constructs and items measuring those constructs.

Common method bias among all the quantitatively measured questionnaire items was checked empirically using Harman's single factor test. It requires conducting an exploratory factor analysis with all items measuring all the research constructs (Podsakoff & Organ, 1986). The principal component with unrotated factor solution extracted multiple factors as suggested by an inspection of the scree plot as well as eigenvalues greater than one. Given that a single factor failed to explain bulk of the variance, common method bias was not a concern.

4.3. Perceived Linguistic Cues to Perceived Authenticity (RQ1: H1-H4)

Figure 5 presents the PLS results highlighting the role of perceived linguistic cues in predicting perceived review authenticity. Perceived specificity was positively related to perceived review authenticity ($\beta = 0.34$, $t = 2.99$, $p < 0.01$, 95% CI [0.27, 0.41]), while perceived exaggeration showed a negative association ($\beta = -0.39$, $t = 3.70$, $p < 0.001$, 95% CI [-0.47, -0.31]). These results lent support to H2 and H3 respectively. Reviews that were perceived as being specific but with limited exaggeration were deemed to be authentic. However, perceived comprehensibility and tentativeness were nonsignificant. Hence, H1 and H4 could not be supported.



Note: *** represents statistically significant relation at the $p < 0.001$ level.
** represents statistically significant relation at the $p < 0.01$ level.
Sample size = 380.
Number of data points = 1,140 (380 x 3) because each participant evaluated three reviews.

Figure 5: PLS result showing the role of perceived linguistic cues.

The model explained 37.50% variability in the dependent variable. Values above 67%, 33% and 19% are considered substantial, adequate, and weak respectively (Urbach &

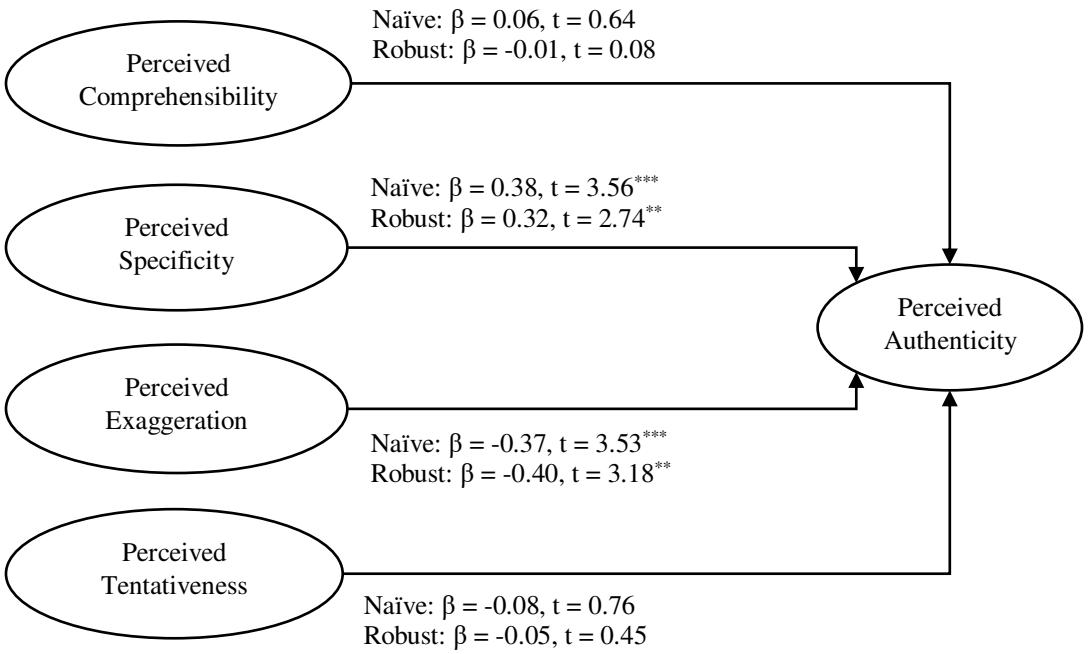
Ahlemann, 2010). This suggests that the perceived linguistic cues could adequately explain perceived authenticity. Nonetheless, the nonsubstantial R^2 value could be because participants were not adept in relying on linguistic cues to judge review authenticity. This offers a possible reason why human ability to infer information authenticity has been consistently found as being far from promising (Bond & DePaulo, 2006; Vrij & Baxter, 1999).

4.4. Moderating Effect of Epistemic Belief (RQ2: H5)

One facet of epistemic belief is perceived reliability of knowledge. On this facet, 138 participants were epistemologically naive, while 107 were epistemologically robust. The former was 67.98% accurate in identifying authentic reviews, and 34.60% accurate in identifying fake entries (overall accuracy = 50.97%). The latter was 70.81% accurate in identifying authentic reviews, and 54.38% accurate in identifying fake entries (overall accuracy = 62.62%).

Among the participants who were epistemologically naive with respect to perceived reliability of knowledge (R^2 = 42.20%), perceived specificity was positively related to perceived authenticity ($\beta = 0.38$, $t = 3.56$, $p < 0.001$, 95% CI [0.30, 0.46]), while perceived exaggeration showed a negative association ($\beta = -0.37$, $t = 3.53$, $p < 0.001$, 95% CI [-0.44, -0.30]). Similarly, among the participants who were epistemologically robust with respect to perceived reliability of knowledge (R^2 = 36.20%), perceived specificity exhibited a positive association ($\beta = 0.32$, $t = 2.74$, $p < 0.01$, 95% CI [0.23, 0.41]) while perceived exaggeration showed a negative relationship ($\beta = -0.40$, $t = 3.18$, $p < 0.01$, 95% CI [-0.49, -0.31]). Perceived comprehensibility and perceived tentativeness were consistently nonsignificant. These results are depicted in Figure 6. According to the multi-group analysis, epistemic belief

with respect to perceived reliability of knowledge did not moderate the relation between any of the four perceived linguistic cues and perceived authenticity.



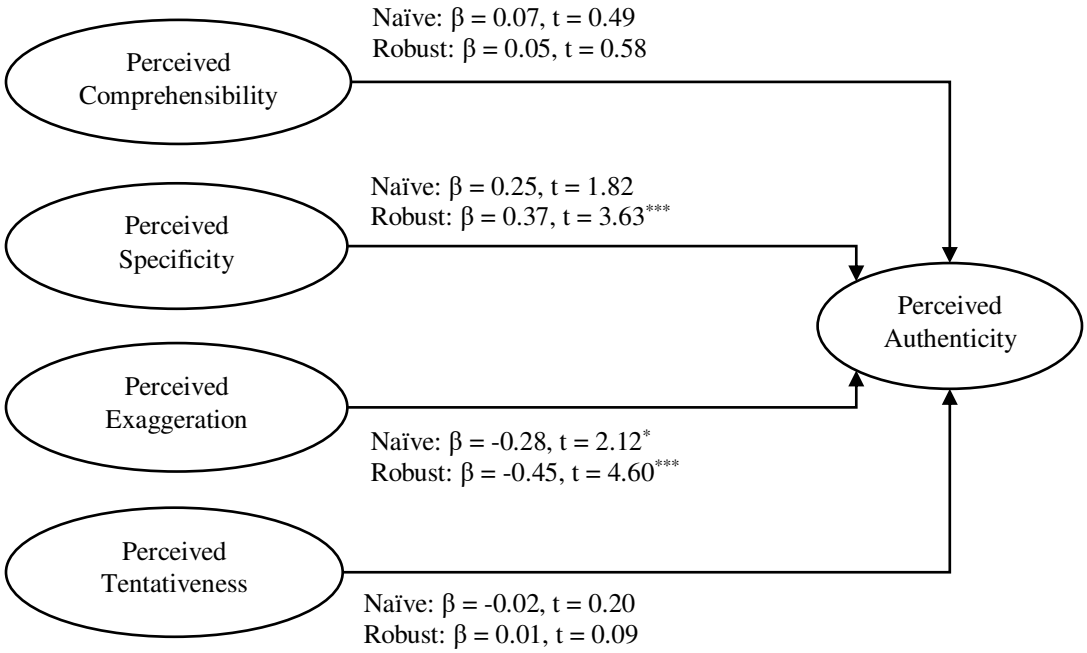
Note: *** represents statistically significant relation at the $p < 0.001$ level.
** represents statistically significant relation at the $p < 0.01$ level.
For epistemologically naïve: sample size = 138, number of data points = 414 (138 x 3).
For epistemologically robust: sample size = 107, number of data points = 321 (107 x 3).

Figure 6: Multi-group PLS result for perceived reliability of knowledge.

The other facet of epistemic belief is perceived justification for knowing. On this facet, 89 participants were epistemologically naive, while 117 were epistemologically robust. The former was 66.67% accurate in identifying authentic reviews, and 40.15% accurate in identifying fake entries (overall accuracy = 53.56%). The latter was 75.15% accurate in identifying authentic reviews, and 45.60% accurate in identifying fake entries (overall accuracy = 59.83%).

Among the participants who were epistemologically naive with respect to perceived justification for knowing (R^2 = 22.70%), only perceived exaggeration was related to

perceived authenticity (β = -0.28, t = 2.12, p < 0.05, 95% CI [-0.35, -0.21]). Among the participants who were epistemologically robust with respect to perceived justification for knowing (R^2 = 49.80%), perceived exaggeration was negatively related to perceived authenticity (β = -0.45, t = 4.60, p < 0.001, 95% CI [-0.54, -0.36]), while perceived specificity showed a positive association (β = 0.37, t = 3.63, p < 0.001, 95% CI [0.29, 0.44]). These results are depicted in Figure 7.



Note: *** represents statistically significant relation at the p < 0.001 level.
* represents statistically significant relation at the p < 0.05 level.
For epistemologically naïve: sample size = 89, number of data points = 267 (89 x 3).
For epistemologically robust: sample size = 117, number of data points = 351 (117 x 3).

Figure 7: Multi-group PLS result for perceived justification for knowing.

The moderating role played by epistemic belief with respect to perceived justification for knowing is summarized in Table 10. Perceived justification for knowing significantly moderated the relation between perceived specificity and perceived authenticity (t = -12.00, p < 0.001). Specifically, the positive relation between perceived specificity and perceived

authenticity was stronger for epistemologically robust participants vis-à-vis epistemologically naive individuals. All else being equal, specific reviews were viewed more favorably by the former in terms of authenticity.

Additionally, perceived justification for knowing significantly moderated the relation between perceived exaggeration and perceived authenticity ($t = 18.89$, $p < 0.001$). Specifically, the negative relation between perceived exaggeration and perceived authenticity was stronger for epistemologically robust participants vis-à-vis epistemologically naive individuals. All else being equal, exaggerated reviews were viewed less favorably by the former in terms of authenticity.

Therefore, H5 could be supported partially—for epistemic belief with respect to perceived justification for knowing, but not for epistemic belief with respect to perceived reliability of knowledge. Even with perceived justification for knowing, the moderating relations were significant in terms of the linguistic cues of specificity and exaggeration, but not for comprehensibility and tentativeness.

Table 10: Moderating role played by perceived justification for knowing.

	Epistemologically Naive		Epistemologically Robust		
Relation	**β**	**Std. Error**	**B**	**Std. Error**	**t-Stat**
PSpe → PA	0.25	0.15	0.37	0.10	-12.00***
PExa → PA	-0.28	0.13	-0.45	0.10	18.89***

Note. PSpe: Perceived specificity, PExa: Perceived exaggeration, PA: Perceived authenticity.
*** represents statistically significant difference between groups at the $p < 0.001$ level.

4.5. Qualitative Results

The exploratory content analysis identified five strategies used by the participants to discern review authenticity. They are assessing comprehensibility, examining specificity, checking the level of exaggeration, looking for conflicting information, and relying on intuition. The first three strategies are consistent with the proposed research model (H1-H3). However, the other two were newly uncovered.

The first strategy to discern authenticity involved assessing the comprehensibility of reviews. For example, participant 236 was concerned about review authenticity due to the presence of "too many grammatical errors." Participant 238 found a review to be "very unclear about what the reviewer wants to say." Likewise, participant 260 commented, "sentence structure is bad." On perceiving these comprehensibility-related cues, all these participants ended up labeling authentic reviews as fake. Perceived comprehensibility did not seem to help individuals in accurately judging review authenticity.

The second strategy to discern authenticity involved examining the specificity of reviews. For example, participant 6 accurately identified an authentic review, "More specific details given in the feedback gives the perception of authenticity." Likewise, participant 258 accurately identified an authentic review because of the "good details provided by the reviewer." However, individuals' perceived specificity occasionally led them to make inaccurate decisions. For example, participant 28 labeled an authentic review as fake because it did not state "many details." This suggests that not all authentic reviews incorporate adequate details.

The third strategy to discern authenticity involved checking the level of exaggeration in reviews. For example, participant 151 accurately labeled a review as fake because its level of exaggeration made it appear "more like an advertisement." Participant 136 accurately identified a fake review that was perceived as being "too much exaggerated." However, individuals' perceived exaggeration occasionally led them to make inaccurate decisions. For example, participant 310 labeled an authentic review as fake because it appeared to make overly "sweeping statements." This suggests that while fake reviews are generally exaggerated, authentic reviews are not always innocuous.

The fourth strategy to discern authenticity involved looking for conflicting information. This strategy did not always help participants in accurately judging review

authenticity. For example, participant 79 labeled an authentic review as fake because its sentences "on hotel services" were perceived as being self-contradictory. Participant 258 labeled a fake review as authentic because there was no conflicting information between the title and the description: "title matched the description." Participant 312 made a similar error by comparing arguments in a review with those present in the other two available entries on the LoveToTravel.com version to which the individual was assigned.

The fifth strategy to discern authenticity involved relying on intuition. For example, participant 28 deemed a review as authentic by arguing, "seems normal." Likewise, participant 168 labeled a review as fake by indicating, "seems fishy." A few participants (e.g., participant 11, participant 328) confirmed that they completely relied on their instincts to infer review authenticity.

There was no clear majority in the use of the five strategies. There were also no conspicuous differences in the choices made by the epistemologically naive and robust participants. Nevertheless, most participants reported to have used only one of the five strategies to decide whether a given review was authentic or fake. Inability to employ multiple strategies per review highlights the limited cognitive efforts that humans make to judge the authenticity of online information.

5. Discussion and Conclusion

5.1. Findings

Three key findings emerged. First, linguistic cues help users ascertain the authenticity of reviews but only to a certain extent. In particular, the perceptions of specificity (H2) and exaggeration (H3) predicted perceived review authenticity. These two linguistic cues are used in computational algorithms to classify reviews as authentic or fake (Banerjee et al., 2017; Harris, 2012; Ott et al., 2011). Dovetailing the literature, the quantitative analysis in this

study found that reviews that are specific but with little exaggeration are more likely to be perceived as being authentic. In addition, the qualitative analysis showed that the perceptions of exaggeration as well as specificity in reviews often helped participants accurately label reviews as authentic or fake. This shows that the two linguistic cues used in computational algorithms could also be used by humans to discern review authenticity.

Nonetheless, the perceptions of comprehensibility (H1) and tentativeness (H4) were not helpful. Previous works have hinted that individuals would have a favorable disposition toward reviews that are comprehensible (Schrank et al., 2010) while being wary of reviews that appear tentative (Porter et al., 2012). However, the quantitative analysis failed to detect any significant relation between perceived comprehensibility and perceived authenticity as well as that between perceived tentativeness and perceived authenticity. The qualitative results revealed that participants occasionally noted comprehensibility-related traits of reviews. Even then, however, they ended up judging review authenticity incorrectly. This finding contradicts the notion of epistemic vigilance, which claims that alertness toward informational content helps distinguish between truth and fiction (Sperber et al., 2010). Overall, it suggests that users cannot simply use the linguistic cues of comprehensibility and tentativeness in an algorithmic manner to discern review authenticity.

The second finding is that users are susceptible to truth bias (Vrij & Baxter, 1999) even though they are capable of looking for self-contradicting evidence in reviews. Irrespective of epistemic belief, participants were relatively better in identifying authentic reviews (accuracy ranged from 67.98% to 75.15%) than in spotting fake entries (accuracy ranged from 34.60% to 54.38%). Despite being in an increasingly tech-savvy society, users still display naivety when dealing with the authenticity of online information.

Nonetheless, users often look for conflicting information within a review to decide whether reviews are authentic. This new finding, which has not been cited in the recent but

related online consumer decision-making literature (e.g., Plotkina et al., 2020), was uncovered through the qualitative analysis. Further research is needed to understand the reasons to use such a strategy. Moreover, previous works on computational algorithms (Banerjee et al., 2017; Ott et al., 2011; Harris, 2012) have also yet to harness inconsistencies within segments of a single review to predict its authenticity. This finding therefore creates an opportunity for further exploration among computer scientists.

The third finding is that epistemic belief (H5) with respect to perceived justification for knowing moderates the relation between perceived linguistic cues and perceived authenticity of reviews. Specifically, exaggerated reviews were viewed less favorably by epistemologically robust participants vis-à-vis epistemologically naive individuals in terms of authenticity. Moreover, the former viewed specific reviews more favorably. However, epistemic belief with respect to perceived reliability of knowledge did not emerge as a significant moderator.

This finding confirms that epistemic belief is not an atomic construct but encompasses disparate facets, namely, perceived reliability of knowledge, and perceived justification for knowing. Moreover, it extends the literature on epistemic belief (Hofer, 2004; Hofer & Pintrich, 1997) by highlighting that perceived justification for knowing could be more influential than perceived reliability of knowledge in shaping the relation between perceived linguistic cues and perceived authenticity of reviews.

These findings notwithstanding, two limitations in this study grant opportunities for future research. First, even though the study had a qualitative component, it encompassed just one open-ended question (Table 3). Future works could conduct in-depth interviews to understand how Internet users ascertain information authenticity along with their underlying reasons. This would enable richer insights to be gleaned. Second, more than half of the 380 participants were students (Table 6). To probe the generalizability of the results, subsequent

research could replicate the current work using a sample of only working adults. Unlike the current work, a sequential mixed methods research design could be employed in the future. It could start with a qualitative exploration of how users assess review authenticity, the findings of which could feed into a more confirmatory-type quantitative investigation. Third, this study used reviews for hotels, an experiential service, as a test case for investigation. The findings may be generalizable to other travel- and hospitality-related experiential services such as restaurants. Nonetheless, future research needs to investigate similar conceptual models in the context of reviews for products.

5.2. Theoretical Contributions

The theoretical contributions of this article are four-fold. First, it represents one of the earliest attempts to understand the relation between perceived linguistic cues and perceived authenticity of online reviews. It confirms prior findings that the online community is sensitive to the language in reviews (Salehan & Kim, 2016). Besides, it extends previous research (Harris, 2012; Ott et al., 2011) by demonstrating the possibility of leveraging linguistic cues used in computational algorithms through human efforts.

Second, this article represents a modest step forward in reconciling a tension in the literature. While the theory of truth bias suggests that users would deem all reviews to be authentic (Vrij & Baxter, 1999), deception bias implies that all reviews would be identified as fake (Burgoon et al., 2005). Building on such insights, this study found that even though truth bias was evident, users who were able to perceive specificity and exaggeration in reviews could often discern authenticity. This supports the notion of epistemic vigilance—humans can spot fake reviews provided they are vigilant toward the textual content (Sperber et al., 2010). While neither truth bias nor deception bias is healthy in the online setting (Burgoon et

al., 2005), being epistemologically vigilant seems to be the key in discerning information authenticity.

Third, from the qualitative analysis, this article uncovers two new strategies—looking for conflicting information, and relying on intuition—that the online community uses to discern authenticity. These strategies have not received much attention in the literature. Of the two, looking for conflicting information seems more reliable while relying on intuition is easier to employ. The ease with which intuition could be leveraged notwithstanding, it can be like a shot in the dark. This offers a possible explanation why previous works consistently found human ability to distinguish between truth and fiction to resemble random guessing (Bond & DePaulo, 2006; Plotkina et al., 2020; Porter & ten Brinke, 2010).

Fourth, this article contributes to the academic discourse on how epistemic belief operates on the Internet. The personal epistemology framework conceptualizes individuals' epistemic belief along two facets: perceived reliability of knowledge and perceived justification for knowing (Hofer, 2004; Hofer and Pintrich, 1997). This study found only the latter to significantly moderate the relation between perceived linguistic cues—specificity as well as exaggeration—and perceived review authenticity. In other words, the assumption that users with robust epistemic belief are better than those who are naive in ascertaining authenticity by identifying linguistic nuances in reviews needs to be qualified. It is only true for epistemic belief with respect to perceived justification for knowing, particularly for the linguistic cues of exaggeration and specificity.

5.3. Practical Implications

The study also has practical relevance. It recommends moderators of review websites to play an active role in identifying and weeding out fake entries from their platforms. The goal is to assure users of the trustworthiness of reviews.

Meanwhile, many businesses select testimonials from review websites such as TripAdvisor to display on their websites. They would do well to choose entries that are specific but not exaggerated as a way to foster perceived authenticity. Otherwise, if users perceive those testimonials to be bogus, any marketing efforts will backfire.

Additionally, this article recommends users not to rely on intuition in order to verify online information authenticity. Critical thinking is important in the current era of ubiquitous online falsehood. Particularly when reading reviews, users could treat excessive exaggeration and inadequate specificity as warning flags. To ensure that they do not let down their guard, they should cultivate robust epistemic belief with respect to justification for knowing. The role of epistemic belief should also be highlighted in digital literacy campaigns.

To conclude, this article hopes to remind businesses that faking reviews could be a futile strategy. It therefore encourages businesses to uphold ethical standards and let review websites be a platform for sharing genuine experiences.

References

Baker, M. A., & Kim, K. (2019). Value destruction in exaggerated online reviews. International Journal of Contemporary Hospitality Management, 31(4), 1956-1976.

Bambauer-Sachse, S., & Mangold, S. (2011). Brand equity dilution through negative online word-of-mouth communication. Journal of Retailing and Consumer Services, 18(1), 38-45.

Bambauer-Sachse, S., & Mangold, S. (2013). Do consumers still believe what is said in online product reviews? A persuasion knowledge approach. Journal of Retailing and Consumer Services, 20(4), 373-381.

Banerjee, S., & Chua, A. (2017). Theorizing the textual differences between authentic and fictitious reviews: Validation across positive, negative and moderate polarities. Internet Research, 27(2), 321-337.

Banerjee, S., Chua, A., & Kim, J. (2017). Don't be deceived: Using linguistic analysis to learn how to discern online review authenticity. Journal of the Association for Information Science and Technology, 68(6), 1525-1538.

Berger, J., & Iyengar, R. (2013). Communication channels and word of mouth: How the medium shapes the message. Journal of Consumer Research, 40(3), 567-579.

Blair, J. P., Levine, T. R., & Shaw, A. S. (2010). Content in context improves deception detection accuracy. Human Communication Research, 36(3), 423-442.

Blanco, C., Sarasa, R., & Sanclemente, C. (2010). Effects of visual and textual information in online product presentations: Looking for the best combination in website design. European Journal of Information Systems, 19(6), 668-686.

Bond, C. F., & DePaulo, B. M. (2006). Accuracy of deception judgments. Personality and social psychology Review, 10(3), 214-234.

Bråten, I., Strømsø, H. I., & Samuelstuen, M. S. (2005). The relationship between Internet-specific epistemological beliefs and learning within Internet technologies. Journal of Educational Computing Research, 33(2), 141-171.

Burgoon, J. K., Blair, J. P., & Strom, R. E. (2005). Heuristics and modalities in determining truth versus deception. Proceedings of the Annual Hawaii International Conference on System Sciences (pp. 1-7). IEEE.

Campbell, D. T., & Fiske, D. (1959). Convergent and discriminant validation by the multitrait-multimethod matrix. Psychological Bulletin, 56, 81–105.

Chan, I. C. C., Lam, L. W., Chow, C. W., Fong, L. H. N., & Law, R. (2017). The effect of online reviews on hotel booking intention: The role of reader-reviewer similarity. International Journal of Hospitality Management, 66, 54-65.

Chan, R. (2004). Consumer responses to environmental advertising in China. Marketing Intelligence & Planning, 22(4), 427-437.

Chang, C. (2016). Responses to conflicting information in computer-mediated communication: Gender difference as an example. New Media & Society, 18(1), 5-24.

Choudhury, V., & Karahanna, E. (2008). The relative advantage of electronic channels: A multidimensional view. MIS Quarterly, 32(1), 179-200.

Connors, L., Mudambi, S.M., & Schuff, D. (2011). Is it the review or the reviewer? A multi-method approach to determine the antecedents of online review helpfulness. Hawaii International Conference on System Sciences (pp. 1-10). New York, NY: IEEE.

Cox, D., Cox, J. G., & Cox, A. D. (2017). To err is human? How typographical and orthographical errors affect perceptions of online reviewers. Computers in Human Behavior, 75, 245-253.

Creswell, J. W. (2014). Research design: Qualitative, quantitative, and mixed methods approaches (4th ed.). London, UK: Sage.

Dai, Y., Van Der Heide, B., Mason, A. J., & Shin, S. Y. (2019). The wisdom of the crowd versus the wisdom in the crowd: Testing the effects of aggregate user representation, valence, and argument strength on attitude formation in online reviews. International Journal of Communication, 13, 3488–3511.

De Ascaniis, S., & Gretzel, U. (2012). What's in a travel review title? In M. Fuchs, F. Ricci, & L. Cantoni (eds.), Information and communication technologies in tourism (pp. 494-505). Vienna, Austria: Springer.

DePaulo, B. M., Lindsay, J. J., Malone, B. E., Muhlenbruck, L., Charlton, K., & Cooper, H. (2003). Cues to deception. Psychological Bulletin, 129, 74-118.

Diamantopoulos, A., & Siguaw, J. A. (2006). Formative versus reflective indicators in organizational measure development: A comparison and empirical illustration. British Journal of Management, 17(4), 263-282.

Diamantopoulos, A., & Winklhofer, H. M. (2001). Index construction with formative indicators: An alternative to scale development. Journal of Marketing Research, 38(2), 269-277.

Ekman, P., & Friesen, W. V. (1969). Nonverbal leakage and clues to deception. Psychiatry, 32(1), 88-106.

Fiedler, K., & Walka, I. (1993). Training lie detectors to use nonverbal cues instead of global heuristics. Human Communication Research, 20(2), 199-223.

Filieri, R., McLeay, F., Tsui, B., & Lin, Z. (2018). Consumer perceptions of information helpfulness and determinants of purchase intention in online consumer reviews of services. Information & Management, 55(8), 956-970.

Fornell, C., & Larcker, D. (1981). Structural equation models with unobserved variables and measurement error. Journal of Marketing Research, 18(1), 39-50.

Furner, C. P., Zinko, R., & Zhu, Z. (2016). Electronic word-of-mouth and information overload in an experiential service industry. Journal of Service Theory and Practice, 26(6), 788-810.

Galante, A., & Thomson, R. (2017). The effectiveness of drama as an instructional approach for the development of second language oral fluency, comprehensibility, and accentedness. Tesol Quarterly, 51(1), 115-142.

George, J. F., Tilley, P., & Giordano, G. (2014). Sender credibility and deception detection. Computers in Human Behavior, 35, 1-11.

Gretzel, U., Yoo, K. H., & Purifoy, M. (2007). Online travel reviews study: Role and impact of online travel reviews. A&M University, TX: Laboratory for Intelligent Systems in Tourism.

Hamby, A., Daniloski, K., & Brinberg, D. (2015). How consumer reviews persuade through narratives. Journal of Business Research, 68(6), 1242-1250.

Harris, C. G. (2012). Detecting deceptive opinion spam using human computation. Proceedings for the Workshops on Artificial Intelligence (pp. 87-93). Palo Alto, CA: AAAI.

Hill, C. (2018, December 10). 10 secrets to uncovering which online reviews are fake. MarketWatch. Retrieved from https://www.marketwatch.com/story/10-secrets-to-uncovering-which-online-reviews-are-fake-2018-09-21

Hofer, B. K. (2004). Epistemological understanding as a metacognitive process: Thinking aloud during online searching. Educational Psychologist, 39(1), 43-55.

Hofer, B. K., & Pintrich, P. R. (1997). The development of epistemological theories: Beliefs about knowledge and knowing and their relation to learning. Review of Educational Research, 67(1), 88-140.

Hu, N., Bose, I., Koh, N., & Liu, L. (2012). Manipulation of online reviews: An analysis of ratings, readability, and sentiments. Decision Support Systems, 52(3), 674-684.

Ip, C., Lee, H. A., & Law, R. (2012). Profiling the users of travel websites for planning and online experience sharing. Journal of Hospitality & Tourism Research, 36(3), 418-426.

Kim, J. Y., Kiousis, S., & Molleda, J. C. (2015). Use of affect in blog communication: Trust, credibility, and authenticity. Public Relations Review, 41(4), 504-507.

Kwon, O., & Sung, Y. (2012). Shifting selves and product reviews: How the effects of product reviews vary depending on the self-views and self-regulatory goals of consumers. International Journal of Electronic Commerce, 17(1), 59-82.

Levine, T. R., Serota, K. B., & Shulman, H. C. (2010). The impact of Lie to Me on viewers' actual ability to detect deception. Communication Research, 37(6), 847-856.

Ludwig, S., de Ruyter, K., Friedman, M., Brüggen, E. C., Wetzels, M., & Pfann, G. (2013). More than words: The influence of affective content and linguistic style matches in online reviews on conversion rates. Journal of Marketing, 77(1), 87-103.

McCornack, S. A. (1992). Information manipulation theory. Communications Monographs, 59(1), 1-16.

McKnight, H., & Kacmar, C. (2006). Factors of information credibility for an internet advice site. Proceedings of the Annual Hawaii International Conference on System Sciences (pp. 113b: 1-10). New York, NY: IEEE.

Nunnally, J. C. (1978). Psychometric theory (2nd ed.). New York, NY: McGraw-Hill.

Ott, M., Choi, Y., Cardie, C., & Hancock, J. T. (2011). Finding deceptive opinion spam by any stretch of the imagination. Proceedings of the Annual Meeting of the Association for Computational Linguistics: Human Language Technologies (pp. 309-319). Stroudsburg, PA: ACL.

Ott, M., Cardie, C., & Hancock, J. (2012). Estimating the prevalence of deception in online review communities. Proceedings of the International Conference on World Wide Web (pp. 201-210). New York, NY: ACM.

Papathanassis, A., & Knolle, F. (2011). Exploring the adoption and processing of online holiday reviews: A grounded theory approach. Tourism Management, 32(2), 215-224.

Park, D., Lee, J, & Han, I. (2007). The effect of on-line consumer reviews on consumer purchasing intention: The moderating role of involvement. International Journal of Electronic Commerce, 11(4), 125-148.

Petter, S., Straub, D., & Rai, A. (2007). Specifying formative constructs in information systems research. MIS Quarterly, 31(4), 623-656.

Plotkina, D., Munzel, A., & Pallud, J. (2020). Illusions of truth—Experimental insights into human and algorithmic detections of fake online reviews. Journal of Business Research, 109, 511-523.

Podsakoff, P. M., & Organ, D. W. (1986). Self-reports in organizational research: Problems and prospects. Journal of Management, 12(4), 531-544.

Porter, S., & ten Brinke, L. (2010). The truth about lies: What works in detecting high-stakes deception? Legal and Criminological Psychology, 15(1), 57-75.

Porter, S., ten Brinke, L., & Wallace, B. (2012). Secrets and lies: Involuntary leakage in deceptive facial expressions as a function of emotional intensity. Journal of Nonverbal Behavior, 36(1), 23-37.

Prasad, U., Kumari, N., Ganguly, N., & Mukherjee, A. (2017). Analysis of the co-purchase network of products to predict amazon sales-rank. Proceedings of the International Conference on Big Data Analytics (pp. 197-214). Cham: Springer.

Prashar, P. (2016, September 8). The impact of online reviews on the hospitality industry. HospitalityNet. Retrieved from https://www.hospitalitynet.org/opinion/4078144.html

Qiu, L., Pang, J., & Lim, K. H. (2012). Effects of conflicting aggregated rating on eWOM review credibility and diagnosticity: The moderating role of review valence. Decision Support Systems, 54(1), 631-643.

Reips, U. D. (2002). Standards for Internet-based experimenting. Experimental Psychology, 49(4), 243-256.

Ringle, C. M., Wende, S., & Will, A. (2005). SmartPLS - Version 2.0 [Computer software]. University of Hamburg: smartpls.de.

Rodríguez, N. G., Pérez, M. J. S., Gutiérrez, J. A. T. (2008). Can a good organizational climate compensate for a lack of top management commitment to new product development? Journal of Business Research, 61(2), 118-131.

Saldaña, J. (2015). The coding manual for qualitative researchers. London, England: Sage.

Salehan, M., & Kim, D. J. (2016). Predicting the performance of online consumer reviews: A sentiment mining approach to big data analytics. Decision Support Systems, 81, 30-40.

Schrank, B., Sibitz, I., Unger, A., & Amering, M. (2010). How patients with schizophrenia use the internet: Qualitative study. Journal of Medical Internet Research, 12(5). Retrieved from http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3057320/

Sperber, D., Clément, F., Heintz, C., Mascaro, O., Mercier, H., Origgi, G., & Wilson, D. (2010). Epistemic vigilance. Mind & Language, 25(4), 359-393.

Steenkamp, J. B., & Geyskens, I. (2006). How country characteristics affect the perceived value of a website. Journal of Marketing, 70(3), 136-150.

Strauss, A., & Corbin, J. (1998). Basics of qualitative research: Techniques and procedures for developing grounded theory (2nd ed.). Thousand Oaks, CA: Sage.

Tausczik, Y.R., & Pennebaker, J.W. (2010). The psychological meaning of words: LIWC and computerized text analysis methods. Journal of Language and Social Psychology, 29, 24-54.

Torres, E. N., Singh, D., & Robertson-Ring, A. (2015). Consumer reviews and the creation of booking transaction value: Lessons from the hotel industry. International Journal of Hospitality Management, 50, 77-83.

Urbach, N., & Ahlemann, F. (2010). Structural equation modeling in information systems research using partial least squares. JITTA: Journal of Information Technology Theory and Application, 11(2), 5-39.

Van Swol, L. M., Braun, M. T., & Kolb, M. R. (2015). Deception, detection, demeanor, and truth bias in face-to-face and computer-mediated communication. Communication Research, 42(8), 1116-1142.

Verhoef, P. C., Franses, P. H., & Hoekstra, J. C. (2002). The effect of relational constructs on customer referrals and number of services purchased from a multiservice provider: does age of relationship matter? Journal of the Academy of Marketing Science, 30(3), 202-216.

Vrij, A., & Baxter, M. (1999). Accuracy and confidence in detecting truths and lies in elaborations and denials: Truth bias, lie bias and individual differences. Expert Evidence, 7(1), 25-36.

Wixom, B. H., & Watson, H. J. (2001). An empirical investigation of the factors affecting data warehousing success. MIS Quarterly, 25(1), 17-41.

Wu, P. F. (2019). Motivation crowding in online product reviewing: A qualitative study of Amazon reviewers. Information & Management, 56(8), 103163.

Xie, H. J., Miao, L., Kuo, P. J., & Lee, B. Y. (2011). Consumers' responses to ambivalent online hotel reviews: The role of perceived source credibility and pre-decisional disposition. International Journal of Hospitality Management, 30(1), 178-183.