Is This Review Believable? A Study of Factors Affecting the Credibility of Online Consumer Reviews from an ELM Perspective

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Abstract

With the ever-increasing popularity of online consumer reviews, understanding what makes an online review believable has attracted increased attention from both academics and practitioners. Drawing on the elaboration likelihood model (ELM), this study examines four information cues used to evaluate the credibility of online reviews: Argument quality, source credibility, review consistency, and review sidedness, under different levels of involvement and expertise. We conducted an online survey that involved users of Epinions.com, a popular online consumer review website, to test the research model empirically. Consistent with previous research, the results reveal that argument quality, a central cue, was the primary factor affecting review credibility. Participants also relied on peripheral cues such as source credibility, review consistency, and review sidedness when evaluating online consumer reviews. Review sidedness had a stronger impact on review credibility when the recipient had a low involvement level and a high expertise level. However, the other interaction effects were not significant. We discuss the theoretical and practical implications of these results.

Keywords: *Online Consumer Reviews, ELM, Review Credibility, Argument Quality, Source Credibility, Review Consistency, Review Sidedness.*

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1. Introduction

As a form of electronic word-of-mouth (eWOM) communication, online consumer reviews have become an essential source of product-related information, and changed the way consumers look for information to support purchase decisions. The massive quantity, diversity, and accessibility of online reviews has contributed to their attractiveness and growing popularity. Compared to traditional word-of-mouth forms of communication, the influence of online consumer reviews reaches far beyond that of a local community network because users can globally access online consumer reviewers via the Internet.

Prior research has demonstrated that online customer reviews can shape consumers' attitudes and affect their purchase decisions (Chen, Dhanasobhon, & Smith, 2001; Cheung, Luo, Sia, & Chen, 2009; Chevalier & Mayzlin, 2006; Dellarocas, Zhang, & Awad, 2007; Liu, 2006; Zhu & Zhang, 2010). Online retailers have an incentive to provide useful reviews to consumers, and thus to help them make better decisions. For online review websites such as Epinions.com, customer reviews generate incomebecause they are a form of advertising and because the websites have the opportunity to license review content to other companies for various marketing purposes (Chen & Xie, 2008). Hence, practitioners have strived to implement different features that allow consumers to identify and evaluate reviews.

Credibility is among the concerns about online consumer reviews; and reviews with high credibility positively impact the degree to which users adopt information (Cheung et al., 2009). Evaluating the credibility of online reviews differs from evaluating offline reviews. With the plethora of available online reviews submitted by strangers worldwide, it is more difficult to judge the credibility of reviews in the online environment. Therefore, what makes an online review seem credible to consumers requires further analysis.

This paper investigates the antecedents of review credibility from the elaboration likelihood model (ELM) perspective (Petty & Cacioppo, 1986). In fact, ELM helps us understand how consumers use the various characteristics of the vast quantity of online reviews to assess the credibility of individual reviews. Specifically, answer the following two research questions: 1) What are the predominant central and/or peripheral variables used for credibility judgment of online consumer reviews?, and 2) How do these variables function for readers at different levels of motivation and ability? The answers to these questions can assist us to recognize the role of various review characteristics in users' evaluation process. Knowing the importance of different characteristics can also assist practitioners to design better websites and reputation systems that enhance their overall credibility while increasing the quality of the reviews.

2. Literature Review

Online consumer reviews are "peer-generated product evaluation[s] posted on company or third-party web sites" (Mudambi & Schuff, 2010, p. 186). Consumers share these text-based product appraisals on the Internet (Stauss, 1997). They are also regarded as one form of electronic word-of-mouth (eWOM) through which Internet users informally and non-commercially interact and exchange positive and negative consumer experiences (Boush & Kahle, 2001; Hu, Liu, & Zhang, 2008). These electronic forms of "real" (i.e., produced by human beings) consumer feedback affect readers' consumer behavior in areas such as product awareness, beliefs, attitudes, buying intention, and other purchase decisions (Hennig-Thurau & Walsh, 2003).

With the availability of innumerable online consumer reviews, consumers who search online for information about a specific product have access to dozens – if not hundreds – of product reviews that vary greatly in quality and credibility. Message credibility has been an important concept in communications research. We define credibility as believability or the characteristic that makes people believe and trust someone or something (Wathen & Burkell, 2002). A credible review is sometimes referred to as a believable review (Fogg el al., 2001). A review that is viewed as credible

is believed and accepted by the receiver and affects their subsequent behavior (Chow, Lim, & Lwim, 1995; Petty & Cacioppo, 1986; Smith & Vogt, 1995).

While the importance of review credibility for consumer behavior has been well established, knowledge about the factors that affect online review credibility from a theoretical perspective remains scant. In traditional contexts such as knowledge adoption in organizations, research has shown that argument quality and source credibility are primary factors that affect the degree of information influence (Sussman & Siegal, 2003). Given the abundance of reviews available online, consumers are not likely to read every review or to individually evaluate a review's argument quality. Instead, they may rely on certain information cues to identify those reviews worth further reading. Additionally, online consumer reviews are typically submitted by strangers worldwide. While individuals in a physical environment usually establish source credibility based on personal interactions over time, this process is unlikely to be possible in an online environment.

This study examines the factors that affect the perceived credibility of an online consumer review by using the elaboration likelihood model (ELM) as its theoretical foundation. As a prominent and well-established model of informational influence, researchers have adopted ELM to study user behavior in computer-mediated and online environments (Sussman & Siegal, 2003; Tam & Ho, 2006). The model provides a conceptual foundation to understand how review cues influence review evaluation, and how the degree of influence is moderated by the recipient's expertise and involvement.

3. Theoretical Foundations and Model

The elaboration likelihood model (ELM) is a theory of informational influence (Petty & Cacioppo, 1986). It provides a theoretical framework for understanding how people process messages that are intended to be persuasive. According to ELM, there are two major routes by which persuasive messages can be processed: the central route and the peripheral route. The central route involves a high level of elaboration, while the peripheral route entails a low level of elaboration. When a recipient processes a message through the central route, they will carefully consider the issues presented in the message and evaluate the merits of the arguments. Under these circumstances, the recipient will undergo further cognitive processing and exert more effort to evaluate a message.

In contrast, the peripheral route requires less cognitive work. People use simple heuristic cues or informational indicators, such as source credibility, to assess the believability of a message. Theoretically, people may elaborate a message purely through either the central or the peripheral route. In practice, people elaborate a message at a moderate level employing both routes (Sussman & Siegal, 2003). Hence, the credibility evaluation of online reviews can be based on both central and peripheral cues. Furthermore, ELM suggests that the degree of elaboration through either the central route or the peripheral route depends on the recipient's ability and motivation.

Informational influence literature and ELM suggest that variables related to: 1) the message, 2) the source, and 3) the recipient affect the degree of a message's influence (Yale's model; Holvand, 1959; Petty & Cacciopo, 1981). Researchers have focused on many message-related and source-related variables in the eWOM and information adoption literature, which include 1) argument quality, 2) source credibility, 3) review consistency, and (4) review sidedness. According to ELM, these variables may take on roles as either central (e.g., argument quality) or peripheral cues (e.g., source credibility) to evaluate online consumer reviews. In addition, the degree of influence of these cues depends on two characteristics (variables) of the recipient: involvement and expertise. Figure 1 depicts the research model.
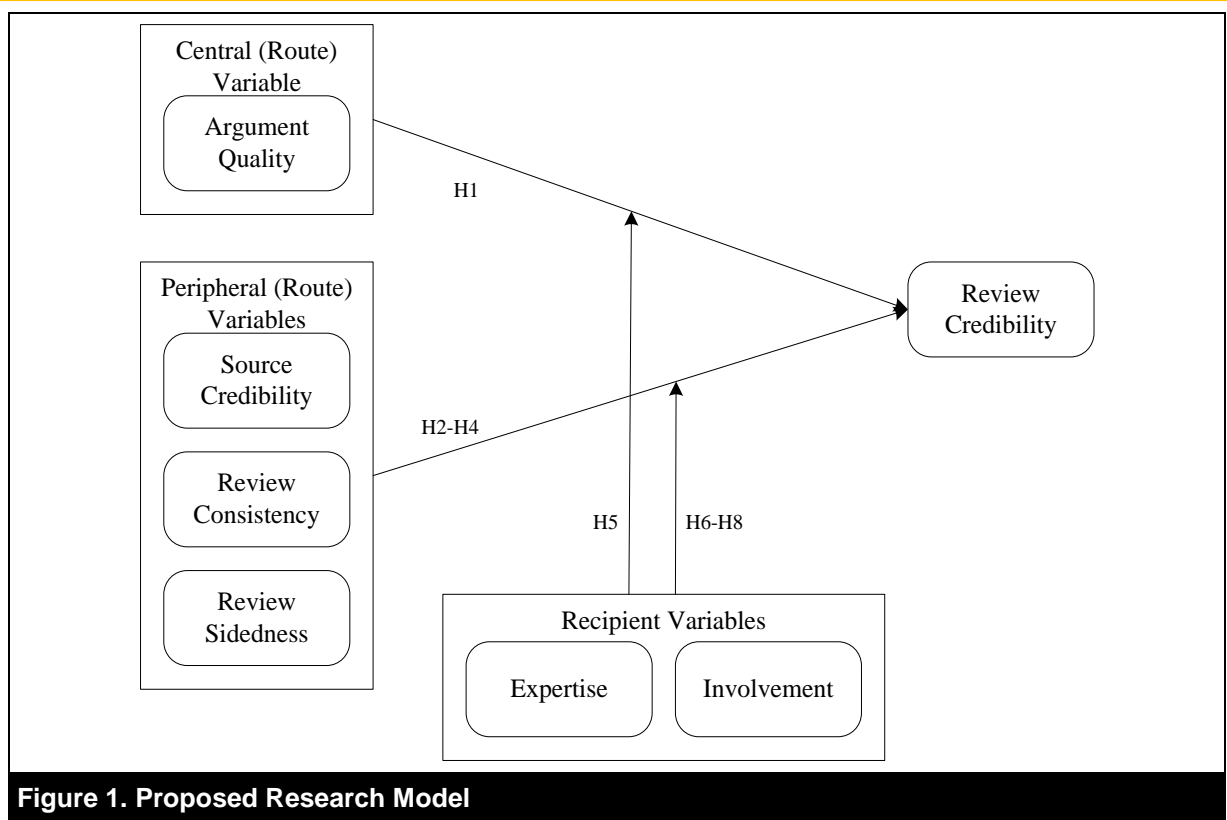
Figure 1. Proposed Research Model

3.1. Central Cue: Argument Quality

Message quality has been consistently identified as a major criterion in the persuasion and communication literature (Miller & Levine, 1996; Slater & Rouner, 1996). In ELM, argument quality refers to "the audience's subjective perception of the arguments in the persuasive message as strong and cogent on the one hand versus weak and specious on the other" (Petty & Cacioppo, 1981, p. 264-5). As a central cue, argument quality determines one's attitude towards a message primarily through careful deliberation about the merits of the arguments presented. A message with stronger arguments is expected to yield more favorable responses. Similarly, information quality has been shown to be an important antecedent of knowledge adoption in organizations (Sussman & Siegal, 2003). It has also been shown to influence how people perceive the believability of web information (Cheung et al., 2009; Wathen & Burkell, 2002). Thus, in the context of online reviews, we expect that a review with a stronger argument quality should be perceived as more credible.

> **H1:** *Argument quality has a positive effect on review credibility.*

3.2. Peripheral Cues

According to ELM, people do not always elaborate on a message's arguments. Instead, they may rely on what ELM refers to as peripheral cues. Unlike central cues (e.g., argument quality), peripheral cues are contextually oriented towards the communication environment andcomprise considerations other than the merits of the arguments themselves. Based on the literature, we have identified three peripheral cues that are important in evaluating the credibility of online reviews: review sidedness, review consistency, and source credibility.

Source credibility refers to a recipient's perception of the credibility of a message source; it is not concerned with the message itself (Chaiken, 1980). Source credibility has consistently been identified as an important cue in informational influence process (Chaiken & Maheswaran, 1994; Pornpitakpan, 2004; Sussman & Siegal, 2003). It is also a primary concern of consumers when engaging in online activities (Brown, Broderick, & Lee, 2007; Cheung et al., 2009; Pavlou & Dimoka, 2006). Source credibility has been shown to have a positive effect on message credibility (Chow et al., 1995; Mak &

Lyytinen, 1997; Slater & Rouner, 1996; Wathen & Burkell, 2002). Hence, we expect that areview from a reputable source will be perceived to be more credible than one from a less reputable source.

> **H2:** *Source credibility has a positive effect on review credibility.*

Review consistency refers to the extent to which information in a review is consistent with information in other reviews. Research has shown that information consistency is a heuristic cue that affects knowledge adoption in the online community (Zhang & Watts, 2004). Individuals heuristically assess a message by comparing that message with other similar messages, and information that is consistently presented by many reviewers is likely to be perceived as being more believable. Online review sites allow large quantities of reviews to be stored and retrieved, and users can easily search for related reviews and compare them. Users are more likely to accept a viewpoint that is consistent across most reviews, and more likely to be sceptical toward a viewpoint that is voiced by a comparatively small number of reviewers.

> **H3:** *Review consistency has a positive effect on review credibility.*

Review sidedness indicates whether a review is one sided or two sided. A one-sided review contains either positive or negative product comments, whereas a two-sided review contains both positive and negative comments on a product. Marketing literature shows that a two-sided message is generally perceived as more believable than one that is one-sided (Kamins & Lawrence, 1988; Chow et al., 1995). For online consumer reviews, a two-sided review may be perceived as more unbiased than a one-sided review, which is often perceived as being either negatively or positively biased.

> **H4:** *Two-sided reviews are perceived to be more credible than one-sided reviews.*

3.3. Recipient's Expertise and Involvement

According to ELM, the degree of influence that results from the central or the peripheral cues depends on the recipient's ability and motivation, which have been empirically studied in terms of the recipient's expertise and involvement (Sussman & Siegal, 2003; Zhang & Watts, 2003). Recipient's expertise refers to the recipient's prior knowledge about the issue, while recipient's involvement refers to the personal relevance of the issue (Sussaman & Siegal, 2003).

ELM states that central cues will have a greater influence on their judgment when a recipient is able and motivated to consider the information in a given message.People with expertise have the knowledge and ability to evaluate a message. Similarly, people with a high level of involvement are sufficiently engaged and motivated to understand a message. Hence, these groups of people are more likely to judge a message based on argument quality (Sussman & Siegel, 2003). In other words, the influence of argument quality is expected to be stronger when the recipient's expertise and/or involvement are higher.

> **H5:** *The effect of argument quality on review credibility is stronger when both the recipient's expertise (H5a) and involvement (H5b) are higher.*

However, when the recipient is unable to or is not motivated to consider the information, peripheral cues are expected to have a greater role in shaping their judgment. People without the relevant expertise simply cannot assess the quality of a message. Similarly, people who are uninvolved are not motivated to cognitively process a message in detail. Rather, an uninvolved novice is more likely to rely on other information cues, such as credibility of the source, when judging a message (Zhang & Watts, 2003). In addition to credibility, a review's consistency with other reviews creates less cognitive dissonance (Festinger, 1957; Strong, 1968; Pornpitakpan, 2004; Cooper, 2007). This is especially true of people who are less involved (i.e., they are not as willing to exert substantial cognitive processing and dissonance resolution efforts), and of those with low expertise levels (i.e., they lack the knowledge/capability to exert more cognitive processing and dissonance resolution efforts). Hence, when faced with a consistent review, such individuals find it easier to accept the review. Similarly, two-sided reviews could provide greater assurance to individuals who are inclined to be less involved, or provide greater justification that a review is credible to those with less knowledge

about the perceived neutrality of the review. Generally, the influence of peripheral cues is expected to be stronger when the recipient's expertise and involvement are at lower levels.

> **H6:** *Source credibility's effect on review credibility is stronger for recipients with lower levels of expertise (H6a) and involvement (H6b).*

> **H7:** *Review consistency's effect on review credibility is stronger for recipients with lower levels of expertise (H7a) and involvement (H7b).*

> **H8:** *Review sidedness's effect on review credibility is stronger for recipients with lower levels of expertise (H8a) and involvement (H8b).*

4. Methodology

4.1. Data Collection

Users of Epinions.com, a well-known online consumer review website, completed an online survey. We selected Epinions.com for this study for several reasons. First, because it is a third-party review site, readers' perceptions of the reviews from this site are likely to be relatively neutral. Second, it has both well-developed reviewer and review rating systems. Third, it has a large member base and active review postings or rating activities. A total of 792 randomly selected Epinions.com users received an email explaining the purpose of the study, and were invited to participate[1]. The survey instructions asked participants to recall the most recent review they had read in Epinions.com, and then complete the survey based on their perceptions of the review[2]. The survey took about 10 minutes to complete. Ninety-nine recipients responded to the survey, which resulted in a response rate of 12.5 percent. Four responses were discarded due to incomplete responses, and subsequently 95 responses were included in the data analysis. According to participants' self-reports, 54 percent were female and 46 percent were male. Sixty percent of participants were aged between 26 and 45, the participants had, on average, 10.44 years' Internet experience.

4.2. Measures

When possible, measurement items were adapted from existing validated scales and modified to fit the context of the study. We measured review credibility, argument quality, reviewer's credibility, recipient's expertise, and recipient's involvement using items adapted from previous studies (see Appendix 1). We developed items for review consistency and review sidedness for this study following procedures recommended by Moore and Benbasat (1991)[3]. We measured all items on a 5-point Likert scale. Appendix A shows the measurement items adapted or developed for the study.

5. Quantitative Analyses and Results

5.1. Measurement Model

To assess the convergent and discriminant validity of the constructs, we conducted a confirmatory factor analysis. Tables 1 and 2 summarize the results 2. Examination of the composite reliability and average variance extracted (AVE) provided evidence of convergent validity (Fornell & Larcker, 1981). The composite reliability of the constructs ranged from 0.80 to 0.98, which is above the recommended benchmark of 0.7 (Barclay, Higgins, & Thompson, 1995; Chin, 1998). AVE measures the amount of variance that a construct captures from its indicators relative to the amount due to measurement error (Chin, 1998). All of the constructs' AVE values were above the recommended level of 0.5 (Chin, 1998).

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[1] By participating in the study, respondents were automatically entered in the lucky draw for three prizes of $50 each.

[2] It is possible that the responses between frequent and non-frequent users could be different due to the frequency of the reviews recalled. T-tests were performed between frequent (top 25%) and non-frequent users (bottom 25%) of online consumer review sites regarding their responses and their demographic characteristics. No significant difference was found.

[3] Independent judges were invited to the card sorting exercises to ensure the scale reliability and validity of the items. All measures were then pretested on 25 review site users. Results of the pilot test demonstrated good construct reliability and validity. Amendments have been made based on the comments of the respondents.

Table 1. Descriptive Statistics, Internal Consistency, and Discriminant Validity of Constructs

		Means	S.D.	Composite Reliability	AVE	1	2	3	4	5	6	7
1	Review Credibility	4.20	0.85	0.958	0.849	0.921						
2	Argument Quality	3.99	0.88	0.941	0.761	0.742	0.872					
3	Source Credibility	4.25	0.98	0.978	0.901	0.596	0.577	0.949				
4	Review Sidedness	3.70	1.19	0.910	0.718	0.553	0.550	0.272	0.847			
5	Review Consistency	3.70	0.90	0.875	0.778	0.507	0.343	0.446	0.153	0.882		
6	Expertise	3.55	0.89	0.926	0.807	0.18	0.087	0.205	-0.011	0.030	0.898	
7	Involvement	3.63	0.78	0.804	0.584	0.387	0.269	0.283	0.387	0.483	0.293	0.764

Table 2. Cross Loadings of Measurement Items of Latent Variables

	Review Credibility	Argument Quality	Source Credibility	Review Consistency	Review Sidedness	Expertise	Involvement
CRED1	**0.91**	0.68	0.57	0.58	0.53	0.11	0.50
CRED2	**0.92**	0.68	0.60	0.46	0.48	0.17	0.35
CRED3	**0.91**	0.64	0.51	0.37	0.49	0.17	0.39
CRED4	**0.94**	0.73	0.51	0.45	0.54	0.23	0.42
ARG1	0.60	**0.88**	0.48	0.32	0.41	0.13	0.34
ARG2	0.60	**0.90**	0.50	0.27	0.47	0.08	0.25
ARG3	0.62	**0.85**	0.45	0.29	0.50	0.04	0.27
ARG4	0.66	**0.90**	0.51	0.25	0.47	0.07	0.31
ARG5	0.72	**0.83**	0.56	0.36	0.53	0.06	0.34
SRC1	0.56	0.54	**0.94**	0.37	0.30	0.22	0.35
SRC2	0.53	0.52	**0.92**	0.41	0.28	0.19	0.32
SRC3	0.59	0.56	**0.95**	0.42	0.29	0.19	0.36
SRC4	0.56	0.55	**0.96**	0.46	0.20	0.19	0.30
SRC5	0.59	0.57	**0.97**	0.46	0.23	0.18	0.34
CON1	0.52	0.35	0.45	**0.93**	0.13	0.07	0.46
CON2	0.34	0.24	0.32	**0.83**	0.14	-0.04	0.42
SIDE1	0.53	0.53	0.30	0.19	**0.90**	-0.02	0.32
SIDE2	0.50	0.43	0.17	0.07	**0.88**	-0.01	0.27
SIDE3	0.30	0.33	0.12	0.03	**0.69**	-0.04	0.10
SIDE4	0.50	0.53	0.30	0.19	**0.90**	0.02	0.28
EXP1	0.14	0.01	0.13	0.15	-0.11	**0.86**	0.36
EXP2	0.17	0.10	0.17	-0.02	0.05	**0.91**	0.27
EXP3	0.18	0.11	0.24	-0.03	0.01	**0.92**	0.17
INVOL1	0.17	0.08	0.11	0.27	0.11	0.31	**0.60**
INVOL2	0.31	0.19	0.21	0.44	0.20	0.04	**0.77**
INVOL3	0.47	0.41	0.39	0.42	0.32	0.33	**0.90**

Thus, we found the measurement model's convergent validity to be satisfactory. A comparison of the AVEs of the constructs with the correlations between constructs provided evidence of discriminant validity. The square root of the AVE value for each construct should exceed the correlation between that construct and other constructs (Chin, 1998; Fornell et al., 1981). Our results show that the discriminant validity of the measurement model was satisfactory. Using the variance inflation factors (VIF), we also evaluated the potential issue of multicollinearity. As a rule of thumb, a VIF greater than 10 indicates the presence of multicollinearity. Results show that all VIFs are less than 2, which suggests that multicollinearity was not an issue.

5.2. Common Method Bias

Because the data were based on perceptual measures from a single source at one point in time, common method bias could be a potential concern (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). Therefore, we assessed common method bias in two ways. First, we conducted a Harman's single factor test (Podsakoff & Organ, 1986) on the constructs in the research model. Results of the principal components analysis show that no single factor emerged from the analysis. The factors accounted for 80.7 percent of the variance, with the first factor accounting for 41.1 percent of the variance, which indicates that common method bias was not likely to have presented an issue.

Second, we included in the research model a common method factor with indicators that included all indicators of the principal constructs, and calculated the variances of each indicator substantively explained by the principal construct and by the method factor (Liang, Saraf, Hu, & Xue, 2007; Podsakoff et al., 2003; Williams, Edwards, & Vandenberg, 2003;). The results demonstrate that the average substantively explained variance of the indicators was 0.789, while the average method-based variance was 0.011. The ratio of substantive variance to method variance is about 70:1. In addition, most method factor loadings were not significant. Given the small magnitude and insignificance of method variance, and the results of the Harman's single factor test, we contend that common method bias is unlikely to be a serious concern for this study.

5.3. Hypotheses Testing

We tested the hypotheses using multiple regression models, and Table 3 reports the results. Model 1 examined the main effects of review cues on review credibility. As expected, argument quality had a significant effect on review credibility. Hence, Hypothesis 1 was supported. Additionally, the path coefficient of argument quality was stronger than those of other review cues. This suggests that, as a central cue, argument quality remains the most influential determinant of review credibility. The effects of source credibility, review consistency, and review sidedness were also significant; reviews from reputable sources with consistent information that covers both positive and negative aspects were perceived as more credible. Hence, Hypotheses 2, 3, and 4 were supported.

We examined the moderating effects of recipient's expertise and involvement using a series of OLS models, which Table 3 shows. We coded both recipient's expertise and recipient's involvement as binary variables based on their median values. By creating product terms using the moderators and the causal variables, we were able to examine the moderating effects. Models 2 and 3 examined the two moderators separately, whereas Model 4 examined the moderators together. To facilitate the interpretation of the results, we examined the main effects of review cues on review credibility separately for different levels of recipient's expertise and recipient's involvement. Table 4 shows the results.

Table 4 shows that the overall effect of argument quality on review credibility was significant (Model 1). In the context of our data, the effects do not appear to vary significantly across different levels of recipient's expertise and involvement (Models 5 to 8). This is consistent with the insignificant moderation effects reported in Table 3 (Model 4). Hence, Hypothesis 5 was not supported. Overall, review consistency and source credibility had significant effects on review credibility (Model 1). Upon further examination, these effects were significant when expertise level was low (Model 5) or involvement level was high (Model 8), and insignificant when expertise level was high (Model 6) or involvement level was low (Model 7). However, the moderation effects were not statistically significant (Model 4). Hence, Hypotheses 6 and 7 were not supported.

Table 3. OLS Results

	Model 1	Model 2	Model 3	Model 4
Argument Quality	0.445* (0.089)	0.461* (0.126)	0.545* (0.105)	0.612* (0.129)
Source Credibility	0.161* (0.066)	0.199* (0.086)	0.139† (0.077)	0.124 (0.101)
Review Consistency	0.221* (0.068)	0.292* (0.087)	0.155† (0.087)	0.262* (0.099)
Review Sidedness	0.175* (0.057)	0.096 (0.078)	0.243* (0.067)	0.144† (0.081)
Expertise		0.634 (0.615)		0.663 (0.581)
Expertise × Argument Quality		-0.004 (0.173)		-0.088 (0.171)
Expertise × Source Credibility		-0.158 (0.131)		-0.025 (0.132)
Expertise × Review Consistency		-0.111 (0.134)		-0.242† (0.128)
Expertise × Review Sidedness		0.192† (0.109)		0.236* (0.104)
Involvement			1.482* (0.742)	1.319† (0.711)
Involvement × Argument Quality			-0.248 (0.173)	-0.266 (0.175)
Involvement × Source Credibility			0.163 (0.133)	0.176 (0.136)
Involvement × Review Consistency			0.059 (0.154)	0.114 (0.149)
Involvement × Review Sidedness			-0.322* (0.119)	-0.337* (0.118)
Constant	0.274 (0.307)	-0.023 (0.488)	-0.071 (0.363)	-0.385 (0.501)
R^2	0.661	0.706	0.722	0.766
Adjusted R^2	0.646	0.675	0.692	0.725

Note: † $p < 0.1$, * $p < 0.05$

Table 4. OLS Results by Expertise and Involvement

	Model 1	Model 5 Low Expertise	Model 6 High Expertise	Model 7 Low Involvement	Model 8 High Involvement
Argument Quality	0.445* (0.089)	0.461* (0.120)	0.458* (0.125)	0.545* (0.115)	0.296* (0.113)
Source Credibility	0.161* (0.066)	0.199* (0.081)	0.041 (0.105)	0.139 (0.084)	0.302* (0.09)
Review Consistency	0.221* (0.068)	0.292* (0.083)	0.180 (0.108)	0.155 (0.096)	0.214* (0.104)
Review Sidedness	0.175* (0.057)	0.096 (0.074)	0.287* (0.081)	0.243* (0.073)	-0.08 (0.081)
Constant	0.274 (0.307)	-0.023 (0.464)	0.610 (0.395)	-0.071 (0.398)	1.411* (0.532)
N	95	51	44	57	38
R^2	0.661	0.633	0.737	0.689	0.633
Adjusted R^2	0.646	0.601	0.710	0.665	0.588

Note: † $p < 0.1$, * $p < 0.05$

The main effect of review sidedness on review credibility was significant (Model 1). The effect was significant when expertise level was high (Model 6) or involvement level was low (Model 7), but not significant when expertise level was low (Model 5) and involvement level was high (Model 8). The moderation effects of expertise and involvement on review sidedness were statistically significant (Model 4). Hence, Hypothesis 8a was reversely supported while Hypothesis 8b was supported. Table 5 summarizes the hypotheses testing results.

Table 5. Hypotheses Testing Results	
H1: Argument quality has a positive effect on review credibility.	Supported
H2: Source credibility has a positive effect on review credibility.	Supported
H3: Review consistency has a positive effect on review credibility.	Supported
H4: Two-sided reviews are perceived as being more credible than one-sided reviews.	Supported
H5: The effect of argument quality on review credibility is stronger when both the recipient's expertise (H5a) and involvement (H5b) are higher.	Not supported
H6: The effect of source credibility on review credibility is stronger for recipients with lower levels of expertise (H6a) and involvement (H6b).	Not supported
H7: The effect of review consistency on review credibility is stronger for recipients with lower levels of expertise (H7a) and involvement (H7b).	Not supported
H8: The effect of review sidedness on review credibility is stronger for recipients with lower levels of expertise (H8a).	Reversely supported
H8: The effect of review sidedness on review credibility is stronger for recipients with lower levels of involvement (H8b).	Supported

6. Discussion

Using ELM as the theoretical framework, this study examined the roles of different review cues in the evaluation of online consumer reviews. The findings provide a few insights about how consumers use online reviews in their purchase decisions. Consistent with past literature on informational influence in traditional settings, we found argument quality to be the most influential factor in the evaluation of online consumer reviews. ELM suggests that the influence of argument quality would be lower when people are unmotivated or unable to elaborate on the reviews. However, the current study found that in the context of online consumer reviews, the influence of argument quality did not significantly vary across different levels of expertise and involvement. This may be explained by the fact that people typically make a deliberate choice to visit online consumer review sites such as Epinions.com to search for information to facilitate their decisions. Hence, these users are somehow motivated to elaborate on the reviews or they would not have visited the online review sites in the first place. In addition, the information in online reviews is generally about products or sellers, which often does not require an exceptionally high level of expertise. Therefore, either novice or expert users should be able to judge the quality of the reviews.

While people primarily rely on argument quality to evaluate online consumer reviews, they also rely on other review cues, such as source credibility, review consistency, and review sidedness. This is consistent with ELM and the informational influence literature, which strongly advocates that message elaboration typically involves a mixture of both central and peripheral cues. In addition, the degree of reliance on the peripheral cues depends on the recipient's expertise and involvement levels. However, the moderation effects of involvement and expertise appear to be more situation dependent and complex than the literature suggests.

ELM suggests that, when a recipient's involvement and expertise levels are high, such a person would rely more on the central cues and less on the peripheral cues. Conversely, when a recipient's involvement or expertise levels are low, they would rely less on the central cues and more on the peripheral cues. In the context of knowledge adoption in organizations, we found that people who were involved and knowledgeable relied more on central cues such as argument quality. However, participants who were not involved or knowledgeable did not necessarily rely more on peripheral cues such as source credibility. Our findings (Table 4) suggest that consumers appear to rely more on source credibility and review consistency in the evaluation of online reviews when their expertise level

is low but their involvement level is high. Thus, in the context of online consumer reviews, people, provided that they are at least motivated and involved to a certain level to take source credibility into consideration, seem to rely more on source credibility when they are not knowledgeable.

Past research has found that an information cue may work as a peripheral cue in some situations but a central cue in other situations (Chaiken & Maheswaran, 1994; Heesacker, Petty, & Cacioppo, 1983). This may explain our findings, which suggest the greater impact of review sidedness not just at a low involvement level but also a high expertise level. For participants who were not motivated to elaborate, reviews were perceived more favorably when they covered both the positive and the negative aspects because these reviews seemed to be fair. For participants with a low involvement level, review sidedness served more as a peripheral cue in the evaluation of online consumer reviews, which is consistent with what ELM and information adoption literature suggests.

ELM also suggests that people who are unable to elaborate on the reviews would perceive two-sided reviews more favorably. However, we found that those with a high (instead of low) expertise level perceived two-sided reviews more favorably. One explanation for this is that people rely on online consumer reviews to facilitate their purchase decisions. Reviews that provide both positive and negative information are useful if users are able to judge the validity of the information. For example, when deciding whether to purchase a particular product, a knowledgeable user may appreciate a two-sided review that covers both the pros and cons of the product. Having the relevant expertise and experience, a knowledgeable user is able to judge the significance of the pros and cons presented in a review, and make the final decision independently. However, a novice user who knows little about the product may favor a one-sided review, preferably from a credible reviewer. Without understanding the significance of the pros and cons presented in a review due to a lack of relevant knowledge, a novice user may find a two-sided review ambiguous. A one-sided review that clearly suggests whether the product is a good buy or not simplifies a novice user's decision processwithout requiring them to appraise the content in detail.

6.1. Limitations

The findings and implications of this study should be interpreted together with its limitations. First, the data used in the study were collected from a single source during a single period of time. Given that Epinions.com is among the most popular online consumer review websites, the brand equity of the website might influence consumers' perceptions of the reviews. The generalization of this study's findings to other online consumer review websites should be exercised with caution.

Second, all measures used in this study were based on respondents' perceptions of their recall of recent reviews. Although there is no evidence that raises concern about the accuracy of the respondents' evaluations due to the accuracy of their recall, future studies using both subjective and objective measures are needed to confirm our findings (e.g., Ghose & Iperiotis, 2006; Ghose & Ipeirotis, forthcoming; Pang & Lee, 2004).

6.2. Implications

The present study provides some implications for both researchers and practitioners. As a general model on informational influence, ELM does not identify specific central and peripheral cues in the informational influence process. The present work has applied the model in the context of online consumer reviews, and has identified five specific information cues that consumers use when evaluating the credibility of online consumer reviews. Understanding the effects of these specific cues would shed some light on how consumers use the information presented in a review during the evaluation process. For example, in addition to looking at the quality of the arguments and the credibility of the reviewer, users also judge the reviews in terms of whether the information is consistent, and whether it covers both positive and negative aspects of the item under review.

This study also contributes to the literature by unveiling the complex roles of different review cues at different levels of the recipient's expertise and involvement. Our findings show that, in the context of online consumer reviews, the effects of these review cues when moderated by the recipient's expertise and involvement appear to be more complex than what ELM suggests. For example, our

findings provide additional support for past studies that suggest an information cue may be used as a central cue in one situation, but used as a peripheral cue in another situation (Chaiken & Maheswaran, 1994; Heesacker et al., 1983). For example, a consumer who is not motivated to digest a review (low involvement) may favor a two-sided review because it "looks fair". However, a consumer with the knowledge to digest a review (high level of expertise) may favor a two-sided review because it actually provides a more comprehensive argument. In the former case, involvement moderates the effect of review sidedness where review sidedness plays a peripheral role (be it fair or unfair) as a peripheral cue. In the latter case, expertise moderates the effect of review sidedness in such a way that review sidedness plays a central role because the consumer fully considers the merits and demerits of the argument.

Our findings also have some implications for practitioners. An effective online review system provides valuable business opportunities with substantial financial implications for both online retailers and third-party review sites. For example, a review site that provides the effective means to facilitate the identification and evaluation of credible reviews can attract more users. Hence, understanding what information consumers use in the evaluation of an online review serves as specific guidance for how to better design and manage an online review system. For example, given how readers rely on different review cues, an online review system could highlight such cues in a prominent location on the website, which would make them easily identifiable and noticeable.

Consistent with previous research, we have found review quality to be the strongest determinant of review credibility. People trust a review more if it provides supportive evidence and explanations. Thus, we suggest that online consumer review providers encourage and help reviewers to provide better reviews. For instance, providers could supply a review template and guidelines with appropriate product/service dimensions that have both positive and negative sections to help reviewers post good quality reviews. This could be supplemented with related photos to enhance the vividness of the review. Alternatively, providers may ask the reviewers to include some information to support their actual usage experiences, such as describing the date, time, and location of their purchases or experiences, or including photographs of the reviewer using the purchased product that could substantiate the contributed review. If possible, they might also collaborate with a product company to invite validated customers to participate in the review.

Apart from review providers, marketers may also be interested in the implications of this research. Some companies have started to actively monitor eWOM activities and have even invested resources in reputation management to monitor their brand's reputation in the online consumer discussion network. One suggestion is the use of reputation intelligence tools, which are able to gather data from different online discussion sources and then visualize such data in the form of reports (e.g., K-matrix Limited, http://www.kmatrixonline.com). For more meaningful and accurate reports, and to reduce information overload for management, reviews can be prioritized according to the quality of the reviews and/or the rating of reviewers. This would provide a more focused and targeted approach to reputation management by highlighting only those comments likely to have a bigger impact on user decisions, rather than requiring users to sift through possibly hundreds of posted comments.

Our findings provide some general design principles to online consumer review providers. With the unstoppable advancement of information technology, the overwhelming number of reviews makes it impossible for online consumer review users to read every review. Online consumer review websites such as Epinions.com might benefit from applying techniques in text mining and computational linguistics to identify two-sided, consistent reviews by reputable reviewers. As our findings suggest, these reviews tend to be generally perceived as more credible.

6.3. Conclusion

Using ELM as the theoretical framework, this study investigated the effects of specific information cues derived from the review message (argument quality, review sidedness, and review consistency) and the source (source credibility) in the evaluation of online consumer reviews. While our findings provide general support for the effects of these cues on the evaluation of online consumer reviews, situational factors such as recipients' involvement and expertise levels may affect how these information cues are used, either as central or peripheral cues. Future studies are needed to more deeply explore the complex interactions among different messages, sources, and recipient factors and how they affect judgment in the context of online consumer reviews.

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Appendices

Appendix A. Measurement Items

Review Credibility (Adapted from Block & Keller, 1995; Smith & Vogt, 1995)
CRED1: I think this review is believable
CRED2: I think this review is factual
CRED3: I think this review is accurate
CRED4: I think this review is credible

Argument Quality (Adapted from Zhang, 1996)
ARG1: This review arguments are convincing
ARG2: This review arguments are strong
ARG3: This review arguments are persuasive
ARG4: The review arguments are good.
ARG5: This review is informative

Source Credibility (Adapted from Berlo, Lemert, & Mertz, 1969)
SRC1: Based on the reviewer rating, this reviewer is reputable
SRC2: Based on the reviewer rating, this reviewer is highly rated by other site participants
SRC3: Based on the reviewer rating, this reviewer is good
SRC4: Based on the reviewer rating, this reviewer is trustworthy
SRC5: Based on the reviewer rating, this reviewer is reliable

Review Consistency
CON1: The comments made in this review are consistent with other reviews
CON2: The comments made in this review are similar to other reviews

Review Sidedness
SIDE1: This review includes both pros and cons on the discussed product/service
SIDE2: This review includes only one-sided comments (positive or negative)
SIDE3: This review is biased towards one side or the other
SIDE4: This review includes both positive and negative comments

Recipient's Expertise (Adapted from Sussman & Siegal, 2003)
EXP1: How informed are you on the subject matter of this review
EXP2: To what extent are you an expert on this review topic
EXP3: To what extent are you knowledge on this review topic

Recipient's Involvement (Adapted from Johar, 1995, Zhang & Watts, 2004)
INVOL1: I was greatly involved in the topic of this review
INVOL2: It was important for me to get information from this review
INVOL3: I am interested in this review topic

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