Examining the moderating role of sense of membership in online review evaluations

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A B S T R A C T

This paper explores how electronic word-of-mouth (eWOM) readers' sense of membership moderates the effects of eWOM antecedent factors on their perceptions of review credibility. To test our hypotheses, we collected 308 samples from two virtual eWOM forums that are famous in China. The results showed that eWOM readers' sense of membership positively moderated argument strength, review sidedness and review rating's effects on review credibility; it also had a negative moderating effect on the relationship between review objectivity and review credibility. Based upon these findings, we discussed the theoretical contributions and practical implications of this study.

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1. Introduction

In recent decades, the Internet has provided extensive opportunities for consumers to share their past shopping experiences and feelings with others. Researchers have referred to such online communications among consumers as electronic word-of-mouth (eWOM) [14,21]. Currently, consumers may be exposed to eWOM information virtually everywhere on the Internet, such as online stores, portal websites, blogs, chat rooms, emails, professional eWOM forums, and so on [30]. Moreover, previous research [29,45] suggests that prospective consumers use eWOM information (i.e., consumer-generated online reviews) to make judgments about target stores, products, and services. For example, Gruen et al. [19] find that eWOM information can have a positive impact on consumers' perceptions of product value and their likelihood of recommending the product. In the same vein, Clemons et al.'s [11] findings show that eWOM information played a significant role in the growth of new products in the marketplace, and Zhang et al. [52] further observe that eWOM information had a stronger effect on consumers' attitudes compared to other types of information, such as professional editors' recommendations.

Because many scholars have already recognized the importance of eWOM information, the antecedent factors of eWOM information credibility have become a crucial and interesting research topic in the field of electronic commerce domain. In fact, several studies [e.g., 6–8, 36, 50] investigate this issue, and they identify a series of significant antecedent factors that affect readers' perceptions of information credibility. Based upon the elaboration likelihood model (ELM) [37,39], those eWOM antecedent factors can be classified into two routes (i.e., central and peripheral). Central route factors are associated with the content of information, whereas peripheral route factors rely heavily on the environmental characteristics of information. Although these previous studies make significant contributions to understanding the impact mechanism of eWOM, they neglect information readers' sense of membership (SOM) in websites (e.g., online stores, forums, etc) that display eWOM information. In fact, previous studies [5,25,26,31,43] already recognize that these websites gradually evolved into virtual communities because many of their participants would develop a sense of emotional belongingness to them, which researchers often refer to as SOM [53]. Because Internet users' participation in communities determines their SOM level, the latter can be used to differentiate among community users. For example, users who frequently visit the community—and thus have a high SOM—can be regarded as community old timers, whereas others who either seldom visit the community or who do so for

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the first time and thus possess low SOM could be considered newcomers.

Previous studies [32,42] argue that SOM can significantly affect community members' cognitive styles and behaviors and that people with different levels of SOM are inclined to utilize different criteria to judge other users and matters in the community. Beyond this theoretical assumption, we contend that different eWOM readers may depend on different antecedent factors to different degrees to judge the credibility of review information, and that one piece of review information may mirror different persuasive effects on different people. Because previous research does not systematically explore this issue, little is known about how eWOM antecedent factors affect readers with different levels of SOM. Thus, this research endeavors to fill that gap. We focus on exploring how the effects of eWOM antecedent factors on eWOM readers' perceptions of review credibility are moderated by their SOM in virtual communities. We believe that by exploring the moderating role of the effects of SOM on eWOM antecedent factors, we can discover the internal impact mechanism of the attributes of information. We hope this study will advance this line of research and help researchers deepen their understanding of the distinct effects of these antecedent factors on different information readers.

We also believe that the results of our research will have valuable implications for practitioners. EWOM communities on the Internet inevitably meet many old and new users on a daily basis. To survive and develop, these communities need not only to retain old timers but also to attract newcomers. One way to achieve these goals is to provide credible information to both types of users. As posited above, eWOM readers with different levels of SOM may utilize different cues to different degrees to evaluate information. However, we find that most eWOM communities utilize only uniform web pages, thus recommending the same review information to all eWOM readers. We contend that this practice is unadvisable because it may result in ineffective eWOM information and consequently, eWOM communities may lose both eWOM readers and the related companies who have adopted eWOM marketing strategies to appeal to those communities. Thus, further exploration of the distinct effects of various eWOM information attributes on different readers (i.e., old and new) is urgently needed to help practitioners design customized review recommendation systems that present the most effective review information to different readers. We believe that increasing the precision of eWOM marketing strategies can further satisfy different readers' information requirements, which could not only help eWOM communities retain old members and attract new ones but also improve the business performance of related companies.

Given the paucity of scientific investigation into this pressing yet intriguing issue, we believe that there is an urgent need to conduct a further exploration of the distinct effects of the attributes of eWOM information on different readers' (i.e., old and new) perceptions of information credibility. Studies in this research domain would serve not only to contribute to the understanding of this important nomological network but also to provide practical marketing strategies to eWOM practitioners. Therefore, the following research question is posed:

How does eWOM readers' sense of membership moderate the effects of eWOM antecedent factors on their perception of information credibility?

This study draws on the most influential eWOM antecedent factors from extant eWOM studies [e.g., 6, 9, 47] to build a research model. To advance this line of research, we incorporate SOM into our research model as a moderator to explore its moderating effects on the causal relationship between eWOM

antecedent factors and perceptions of information credibility. The rest of this paper is organized as follows. First, we will introduce the concept of SOM. We then will propose our research hypotheses. Next, we will describe the collection of the data used to test our hypotheses, followed by the results of the data analyses. Finally, we acknowledge the limitations of the study, and we present the theoretical and practical implications of our findings.

2. Sense of membership

SOM, which is also named sense of belonging, is defined as 'individuals' identification with a group in the sense that people come to view themselves as members of a community' [22,32]. As an integral part of the community, a member's SOM reflects his or her emotional attachment to the community [3,20,53]. A community is a social entity in which people interact with each other because of the presence of a unity of will [48], and it contains a boundary that helps community members to separate "us" from "them". This boundary provides members with a perception of emotional safety that is necessary for them [17]. By frequently participating in the community and interacting with other members, a person will gradually develop a strong SOM with the community, which is the key determinant of the community's cohesion [32].

Although SOM was originally defined in brick-and-mortar communities, various scholars [26,34,49,53] believe that it also applies to online virtual communities. A virtual community is a new form of social entity in which members share information for mutual learning and problem solving via the Internet [28]. Previous studies [32,42] indicate that SOM affects Internet users' cognition and behavior in virtual communities. Thus, people with high SOM may be inclined to utilize different criteria to evaluate other members and information in the virtual community, compared with other low-SOM people. Moving beyond this viewpoint, we postulate that SOM can affect eWOM readers' perceptions of information credibility. However, we do not predict that SOM has a direct effect on information credibility because it is illogical to deduce that eWOM readers with high SOM will believe review information without evaluating its characteristics. It is also irrational to conclude that eWOM readers with low SOM will arbitrarily refuse to accept information without considering its attributes. This is contrary to common sense. However, it is more rational to predict that eWOM readers with different levels of SOM utilize different eWOM antecedent factors to different degrees to evaluate the credibility of information. In this study, we therefore predict that the effects of different eWOM antecedent factors on readers' perceptions of information credibility are moderated by their SOM perception, which is consistent with the findings of previous eWOM research [9,47], which state that information readers' characteristics (e.g., their involvement and expertise levels) can serve as moderators that significantly affect their evaluation criteria for the received eWOM information.

3. Research model and hypotheses

With its comprehensive literature review on previous eWOM research [e.g., 7, 8, 36, 47, 50], this study utilizes review argument strength, review sidedness, and review objectivity (the central route factors), together with source credibility, review consistency and review rating (the peripheral route factors) as the antecedent factors of readers' perceptions of review credibility. We predict that SOM serves as a moderator to modify the effects of these antecedent factors on review credibility. The research model is shown in Fig. 1.
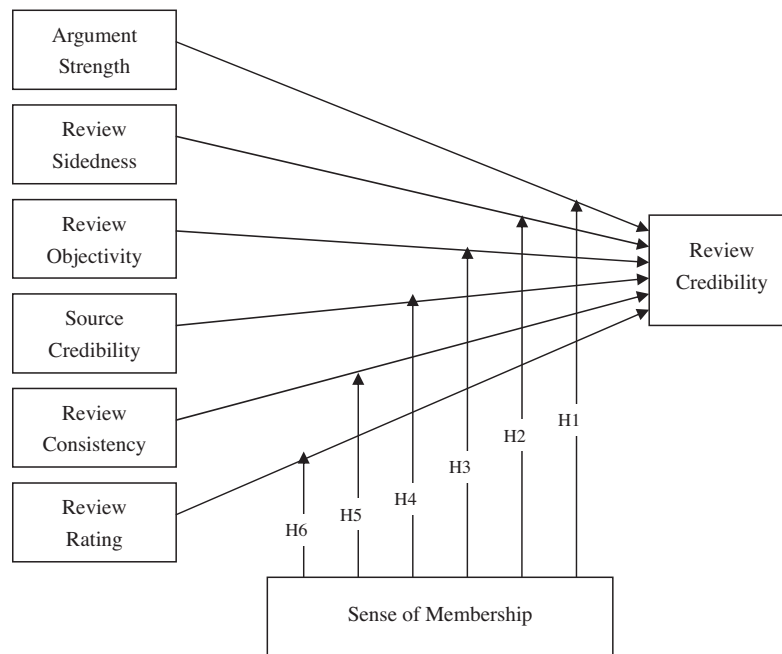
Fig. 1. Research model.

3.1. The moderating effect of SOM on the central route factors

Previous studies [47,50] often consider information quality the only central factor affecting information readers' cognition, whereas recent studies [6,9] regard it as an imprecise measurement because this construct contains various components that may exert different effects on information readers. The literature review [8,9,36] revealed three central factors considered crucial components of information quality: argument strength, information sidedness, and information objectivity.

Argument strength, which is defined as the strength or plausibility of the argumentation of the information [16,51], is the extent to which information recipients perceive an argument as valid and convincing. Prior research [9] has empirically confirmed that argument strength can positively affect information readers' perceptions of information credibility. While they scrutinize information, information readers are also inclined to utilize information sidedness to make judgments about it. The term information sidedness is used to indicate whether the information comprises one side of a viewpoint (either positive or negative) on the target issue or whether it addresses both viewpoints. Research [23] confirms that two-sided information can create the perception of higher information credibility because it leads to fewer counterarguments [24]. A prior study [36] finds that the subjectivity/objectivity attribute of information also can affect information recipients' attitudes toward that information. The result shows that objective information is perceived as more credible than subjective information, because its content is more rational and concrete [35].

Some research argues that information subjectivity/objectivity is correlated with argument strength because objective information includes valid and accurate argumentation [38]. However, we believe that information subjectivity/objectivity have different connotations because objective information may not be regarded as strong-argument information under various conditions. For instance, one review states, "This restaurant is located downtown, and the average price per person is approximately 30 RMB." According to our pilot test, people considered this piece of information an objective review, regardless of its low argument

strength. Furthermore, even if people considered another review to contain highly persuasive argumentation, in many cases, they still considered that this message elicited strong subjective emotion. Therefore, we retain subjectivity/objectivity and argument strength as separate variables in our research model, and we attempt to determine whether they have different effects on eWOM readers' perceptions of review credibility.

We predict that in an eWOM forum, the effect of argument strength on high-SOM eWOM readers' perceptions of review credibility will be stronger than on low-SOM readers. As previous research [17,32] states, a virtual community has a specified boundary. High-SOM members will believe that they are in the boundary and perceive more emotional safety in the virtual community. However, emotional safety will not lead them to directly believe received information without any evaluation of its attributes. Instead, as previous research [22] states, emotional safety will induce readers to spend more cognitive effort to address the received information. From this perspective, we predict that eWOM readers with high SOM will carefully evaluate the argument strength of the review information and judge the credibility of the received information based on their cognition of argument strength [17,42]. Consequently, we speculate that argument strength will exert a significant and positive effect on high-SOM eWOM readers' perception of review credibility. For Internet users who hold low SOM in a virtual community, they will perceive they are outside the boundary, they may spend less cognitive effort to evaluate the argument strength of received eWOM information and thus, the effect of argument strength on their perception of review credibility will be attenuated. We therefore state the following hypothesis:

H1. The higher the eWOM readers' sense of membership, the stronger the effect of argument strength on their perceptions of review credibility.

Information sidedness is another important component of information quality. In general, two-sided reviews contain both positive and negative comments about the discussed targets. Thus, such reviews are more comprehensive than one-sided reviews. We predict that high-SOM eWOM readers may be more willing to

believe the two-sided review information; the reason is similar to the case of argument strength. As we stated, for high-SOM eWOM readers, Hsu and Liao [22] indicate their inclination to utilize their cognitive evaluation toward review content to judge the credibility of the information; probably they will be more willing to believe the two-sided reviews because such information provides them with information about the discussed targets that is more comprehensive. Therefore, we predict that the effect of two-sided reviews on eWOM readers' perceptions of review credibility will be relatively significant in this condition. However, if eWOM readers do not have strong SOM, they will be less inclined to utilize cognitive effort to carefully evaluate the content of the received information, which may weaken the effect of the two-sided reviews. We therefore state the following hypothesis:

H2. The effect of two-sided reviews (compared with one-sided reviews) on eWOM readers' perceptions of review credibility will be strengthened if eWOM readers have a strong sense of membership, compared to readers with a weak sense of membership.

We predict that when eWOM readers perceive a high level of SOM, regardless of whether the review is objective or subjective, they may regard it as equal. This is because virtual community members with high SOM often have strong emotional connections to other community members because they feel that they are "in the group" [32]. High-SOM readers may consider that other members contribute to the community based on their thoughts about reciprocation and are willing to act in accordance with the rules and the norms embedded in the virtual community [42]. Thus, even if the received reviews contain subjective emotion, high-SOM readers may still be less suspicious about that information because they believe that review composers will not deliberately cheat them. Consequently, they will not discriminate between subjective and objective information. However, we predict that eWOM readers who feel outside of the community (i.e., low-SOM eWOM readers) are more willing to accept review information that consists of objective statements without strong subjective emotion because such information provides more facts about the discussed targets [35]. We therefore state the following hypothesis:

H3. The effect of objective reviews (compared with subjective reviews) on eWOM readers' perceptions of review credibility will be attenuated if eWOM readers have a strong sense of membership, compared to readers with a weak sense of membership.

3.2. The moderating effect of SOM on the peripheral route factors

According to the ELM, many peripheral factors can significantly affect eWOM readers' perceptions of review credibility. One of this route's factors comprises the characteristics of the information source [47], such as source credibility, attractiveness, likeability, and so on. Extant studies [8,50] find that source credibility is the most salient factor in the virtual world. Source credibility is defined as information recipients' perceptions of an information source's expertise and trustworthiness [46]. Prior research [8,50] empirically confirms the positive effect of source credibility on eWOM readers' perceptions of information credibility.

The other typical group in the peripheral route comprises social factors [8]. Pornpitakpan [41] indicates that a person's attitude toward information will be affected by the attitudes of other community members. Related studies [8,15,27] consider information consistency and information rating to be representative social factors. Information consistency is defined as the extent to which information is consistent with other information that discusses the same target [4]; information rating reflects the overall rating of current information given by previous readers [8]. Cheung et al. [8]

confirm the positive effects of both social factors on eWOM readers' perceptions of information credibility in the virtual world.

In this study, we predict that a source credibility's effect on review credibility will be enhanced if eWOM readers have strong SOM. Members' source credibility reflects the extent to which they have made valuable contributions (e.g., composing many insightful and truthful reviews, and often attending community activities) to the virtual community [50]; these contributions will be recorded in their profile pages. In addition, the administrators of the virtual community will award corresponding hierarchies to the members based on their contributions to the community. Thus, eWOM readers can utilize reviewers' hierarchies and contributions recorded in their profile pages to evaluate their source credibility. Because high-SOM eWOM readers have a strong sense of identification in the community, we speculate that they will be inclined to utilize the review composers' hierarchies and previous contributions to the virtual community to make their judgments. Consequently, source credibility will exert a significant and positive effect on their perception of review credibility. However, low-SOM eWOM readers have less identification in the virtual community [32] and therefore we posit that the review composers' high source credibility might not induce their perceptions of review credibility. We therefore state the following hypothesis:

H4. The higher the eWOM readers' sense of membership, the stronger the effect of source credibility affects their perception of review credibility.

We expect that eWOM readers' perceptions of SOM also moderate the effect of review consistency on the perception of review credibility. A high level of review consistency indicates that a current review's perspective is similar to other reviews that discuss the same target, which means that different members in the virtual forum share the same attitude. Therefore, the attitude can be regarded as a well-acknowledged viewpoint in the virtual community. Undoubtedly, if eWOM readers have high SOM in a virtual community, they often have a high identification in the virtual community, thus possess a strong mass-following psychology, and seldom question other members' views [10]. Therefore, we predict that the positive effect of review consistency on eWOM readers' perceptions of review credibility will be strengthened in this situation. EWOM readers who have lower SOM in the virtual forum do not have strong emotional connections with other members. We posit that those readers may be less inclined to follow the herd. Thus, they may not be significantly affected by the consistent review information. We therefore state the following hypothesis:

H5. The higher the eWOM readers' sense of membership, the stronger the effect of review consistency affects their perceptions of review credibility.

Cheung et al. [8] indicate that information rating is another social factor that positively affects eWOM readers' perceptions of review credibility. We believe that its effect will also be strengthened when eWOM readers possess a strong SOM. Information rating is an endorsement of a review, which is rated by other members (e.g., previous readers) of the virtual community. Reviews with a high rating can be regarded as highly acknowledged information. As previously explained, members with a strong SOM often have a stronger inclination to follow the herd [10] and therefore they may be more willing to accept the viewpoints of highly rated reviews; thus, the effect of the review rating on review credibility will be correspondingly enhanced. In contrast, eWOM readers who feel outside the community may not be as strongly affected by the endorsements of other members of the virtual community. Consequently, the effect of the review's

rating on readers' perceptions of review credibility may be weakened. We therefore state the following hypothesis:

H6. The higher the eWOM readers' sense of membership, the stronger the effect of review rating affects their perceptions of review credibility.

4. Methodology

To conduct our investigation into the research question, we developed a research project designed to collect valid data from actual users of the appropriate systems. Our methods are described in the following sections.

4.1. Field data

The hypotheses were tested using the field data collected from two popular, well-known eWOM forums in China: www.dianping.com (i.e., "review") and www.koubei.com (i.e., "word of mouth"). We believe that using field data collected from members of these real virtual communities enhances this study's realism. We chose these two forums for several reasons: (1) they are the earliest forums founded in China (dianping was founded in 2003, and koubei was founded in 2004), so they have already cultivated mature virtual communities; (2) only these two forums declared that they had more than 50 million active members by the end of 2012 and therefore they are China's leading forums; (3) only these two forums have sub-websites in more than 300 cities in mainland China, which facilitated the selection of sample candidates nationwide; (4) both forums focus on discussing brick-and-mortar shops, such as restaurants, hotels, shopping malls, and so forth, so they have the same marketing orientation; and (5) the two forums' webpage designs are similar, and both contain various features that ensured that we could collect data relevant to the theoretical constructs of our research model. In addition, we conducted preliminary interviews on the popularity of various Chinese eWOM forums with approximately 70 undergraduate students majoring in electronic commerce at a leading Chinese university. Most of these students acknowledged that these two websites were the most frequently visited third-party eWOM forums in their daily lives. These factors confirm that our survey population is representative.

To ensure a proper sampling frame, we employed a stratified random sampling method, with no self-selection bias. For each forum, we employed a quasi-random selection of one thousand members from the member lists of one hundred cities, which included all of mainland China's 33 provinces. During the sample selection process, we deliberately selected members with various characteristics (e.g., their initial registration date and their activities in the two forums) to ensure that our sample would adequately reflect the forums' actual member demographics. We sent invitation emails to these members via the forums' embedded email systems. The invitation informed the candidates that the purpose of the study was to investigate how review information affected their attitudes. The subjects were also notified that we would pay 20 RMB (approximately 3.50 USD) to each participant. If they agreed, we first required them to read one review based on their current needs or interests, and then we sent them a questionnaire to complete.

The online instrument has three main sections. The first section includes a brief introduction to this study, with instructions for reading the online review. To improve the validity and reliability of our data, we embedded an "instructional manipulation check" [33], which asks the participant to provide the hyperlink of the review. This confirms that the survey participants read the review and could properly complete the

questionnaire. The second part of the instrument includes the items for all of the constructs in our research model. The scales for each construct utilize a multiple-item 7-point Likert scale comprised of reflective indicators. The respondents were informed that there were no "correct" answers to any question and that they should complete the questions based on their perceptions. The third section included demographic questions.

All of the instrument items for the constructs in our research model (see Appendix A) were adapted from previous research, with slight amendments to fit the context of this study. To ensure minimum discrepancy during the instrument translation process, we first translated the English items of the constructs into Chinese and then invited two native Chinese-speaking professors of management information systems who had earned advanced degrees overseas to check the translations. Trivial wording and glitches in meaning were remedied through this validation process. We conducted a pilot test in which we invited 30 dianping and koubei members to proofread the questionnaire; all of the participants indicated that they had no difficulties in understanding the meanings of the items.

4.2. Sample demographics

During the three-month data-collection process, we collected 308 samples: 168 from the koubei forum and 140 from the dianping forum. All of the respondents passed the manipulation check, perhaps because they were motivated by the reward, so nobody was eliminated. Table 1 shows the demographic statistics of the samples. The subjects were in 39 Chinese cities in 18 provinces. Their occupations include student, clerk, worker, manager, and so on. Their experiences with the forums were different, ranging from a few days to more than five years. We believe that the samples adequately represent the population of forum members because their demographic characteristics are similar to those of average Chinese netizens [12]. We also adopted ANOVA to compare various demographic characteristics of the subjects in the two forums. The results showed a significance level above 0.1 for all of the demographic variables, which indicated no significant differences between the two groups of subjects.

5. Results

5.1. Measurement model analyses

Confirmatory factor analysis (CFA) was used to test the measurement model. In particular, convergent validity and discriminant validity were used to test the constructs of the

Table 1
Sample demographics.

Participants (of 2000)	308	15.4%
Cities (of 100)	39	39%
Provinces (of 33)	18	54.5%
Gender		
Male	155	50.3%
Female	153	49.7%
Age range		
<20	51	16.6%
20–24	204	66.2%
25–29	42	13.6%
30+	11	3.6%
Education		
High School Graduate	28	9.1%
Bachelor's Degree	203	65.9%
Master's Degree and above	77	25%

Table 2
Descriptive results and internal consistency of model constructs.

Construct items	No. of items	Means	Standard deviation	Cronbach's alpha	AVE	Composite reliability
Argument Strength (RAS)	6	5.16	1.09	0.94	0.77	0.95
Review Sidedness (RSD)	4	3.81	1.31	0.81	0.54	0.80
Review Objectivity (ROT)	3	4.61	1.09	0.79	0.71	0.88
Source Credibility (SCD)	3	4.64	1.17	0.89	0.83	0.94
Review Consistency (RCN)	3	5.01	0.97	0.90	0.83	0.94
Review Rating (RRT)	3	4.65	1.08	0.89	0.82	0.93
Sense of Membership (SOM)	4	4.16	1.36	0.92	0.81	0.94
Review Credibility (RCRD)	4	5.18	1.04	0.95	0.87	0.96

research model. Convergent validity is used to judge the extent to which each measurement item is related to its corresponding theoretical construct. Fornell and Larcker [18] suggest utilizing item reliability, composite reliability, Cronbach's Alpha and average variance extracted (AVE) for each construct to assess the convergent validity. As shown in Table 2, the composite reliability of all of the constructs is above 0.8, Cronbach's Alpha is above 0.7, and AVE is above 0.5, which are all beyond their corresponding thresholds. Table 3 shows that the factor loading of most items was above 0.7 (item ROT3 was very close), which confirms that the item reliability is acceptable. In general, these results confirmed the high convergent validity of our data. Discriminant validity refers to the extent to which the items in a construct are distinct from those of other constructs. As shown in Table 4, the square roots of the AVE of all constructs were much larger than all other cross-correlations, which confirmed sufficient discriminant validity of the constructs [18].

Multicollinearity indicates the extent to which an independent variable varies with other independent variables. The statistical result showed that the variance inflation factors (VIF) of all independent variables were lower than 10, thus suggesting that

multicollinearity is not a problem in this study [2]. In addition to implementing the recommended a priori measure to minimize common method bias, including randomization, we also utilized Harman's single factor to test the potential common method bias. The result revealed that the first factor did not account for a majority of the variance, nor did any single factor emerge from the factor analysis [40]. This result suggested that common method bias is not a serious threat.

5.2. Structural model analyses

After standardizing the data, we used SPSS to test the structural model. To reconfirm (or disconfirm) the findings of previous research, we first tested the main effects of the six independent variables on the dependent variable. We then tested the moderating effects of SOM on the causal relationships between these independent variables and the dependent variable. This process helped us to verify the validity of our research hypotheses.

We adopted linear regression to test the effects of the eWOM antecedent factors on eWOM readers' perceptions of review credibility; the independent variables were regressed to the dependent variable. Table 5 shows that the full model is significant, with $F = 65.619$, $p < 0.001$, and adjusted $R^2 = 56.7\%$. The results showed that three antecedent factors—RAS, ROT and RCN—significantly affected eWOM readers' perceptions of review credibility at $p < 0.001$. In addition, SCD significantly affected review credibility at $p < 0.01$, but RSD and RRT were not significant in the model.

We hypothesized that SOM moderates all of the causal relationships between the independent variables and the eWOM readers' perceptions of review credibility. To examine these hypotheses, we built moderated multiple-regression models [13]. First, six product terms were built by multiplying the value of SOM and the six independent factors individually. We then added the six independent variables, the moderator variable SOM, and the six product terms to the model. The significance of the product terms demonstrated the moderating effect of SOM on each independent variable.

Table 6 shows the significance of the full model, with $F = 4.442$, $p < 0.001$ and $\Delta R^2 = 4.1\%$. The results indicated that SOM

Table 3
Factor loadings and cross-loadings for all constructs.

	RAS	RSD	ROT	SCD	RCN	RRT	SOM	RCRD
RAS1	0.746							
RAS2	0.803							
RAS3	0.853							
RAS4	0.776							
RAS5	0.779							
RAS6	0.790							
RSD1		0.703	0.432					
RSD2		0.868						
RSD3		0.767						
RSD4		0.765	0.375					
ROT1			0.707					0.362
ROT2			0.755					
ROT3			0.695					0.340
SCD1				0.852				
SCD2				0.840				
SCD3				0.705				
RCN1					0.731			
RCN2	0.314				0.782			
RCN3	0.331				0.775			
RRT1						0.823		
RRT2						0.831		
RRT3						0.705		
SOM1							0.912	
SOM2							0.919	
SOM3							0.877	
SOM4							0.789	
RCRD1	0.304							0.742
RCRD2	0.354							0.802
RCRD3	0.341							0.794
RCRD4	0.328							0.786

Note: Table shows loading or cross-loading > 0.3.

Table 4
Square root of AVE and cross-correlations.

	RAS	RSD	ROT	SCD	RCN	RRT	SOM	RCRD
RAS	0.877							
RSD	0.287	0.735						
ROT	0.610	0.391	0.843					
SCD	0.478	0.291	0.429	0.911				
RCN	0.628	0.235	0.514	0.513	0.911			
RRT	0.511	0.269	0.512	0.629	0.559	0.906		
SOM	0.336	0.188	0.372	0.293	0.261	0.301	0.900	
RCRD	0.664	0.322	0.603	0.531	0.622	0.528	0.372	0.933

Table 5
Main effects test.

Model	Unstandardized coefficients		Standardized coefficients	T	Sig.
	B	Std. Error	Beta		
RAS	0.307	0.055	0.307	5.610	0.000
RSD	0.059	0.039	0.059	1.521	0.129
ROT	0.181	0.051	0.181	3.562	0.000
SCD	0.149	0.051	0.149	2.942	0.004
RCN	0.228	0.053	0.228	4.286	0.000
RRT	0.051	0.053	0.051	0.959	0.338

$F = 65.619$, $R^2 = 0.567$, Dependent Variable: Review Credibility (RCRD).

Table 6
Moderating effects test.

Model	Unstandardized coefficients		Standardized coefficients	t	Sig.
	B	Std. error	Beta		
RAS*SOM	0.142	0.063	0.146	2.267	0.024
RSD*SOM	0.124	0.038	0.129	3.280	0.001
ROT*SOM	−0.210	0.051	−0.226	−4.136	0.000
SCD*SOM	−0.042	0.048	−0.047	−0.868	0.386
RCN*SOM	−0.020	0.059	−0.020	−0.348	0.728
RRT*SOM	0.109	0.052	0.113	2.108	0.036

$F = 4.442$, $\Delta R^2 = 0.041$, Dependent Variable: Review Credibility (RCRD).

moderates four of the six causal relationships between eWOM antecedent factors and perceptions of review credibility. For argument strength, the significant positive coefficient = 0.146 at $p < 0.05$ level supports H1; for review sidedness, the significant positive coefficient = 0.129 at $p < 0.001$ level supports H2; for review objectivity, the significant negative coefficient = −0.226 at $p < 0.001$ level supports H3; for review rating, the significant positive coefficient = 0.113 at $p < 0.05$ level supports H6. However,

for source credibility and review consistency, SOM cannot significantly moderate their effects on review credibility. Thus, H4 and H5 are not supported.

The results of all analyses are shown in Fig. 2.

We also utilized the simple slopes test [1,13] to explore the internal mechanisms of these moderating effects. This method is helpful for interpreting the interaction effects of two continuous predictors. Following the instructions, we computed, plotted, and tested separate regression lines with one standard deviation below the mean of the moderator and one standard deviation above it. Using this method, we interpreted the significance level of the causal relationships between the independent variable and the dependent variable under high or low levels of the moderator. Figs. 3–8 show the results of this test, in which the numerical values are the standardized values.

As shown in Fig. 3, when SOM is high, the slope is steeper than when SOM is low. This indicates that with an increase in argument strength, high-SOM eWOM readers' perception of review credibility is enhanced accordingly. However, for low-SOM readers, the factor of argument strength was not strong enough to affect their perceptions of review credibility. Fig. 4 shows that the high-SOM readers were more inclined to believe the two-sided review, compared with one-sided information, whereas the low-SOM readers treated these two kinds of reviews equally. Fig. 5 shows that low-SOM readers considered objective information more credible than subjective information. High-SOM readers were not willing to utilize this information attribute to judge the information's credibility. Fig. 8 shows that high-SOM eWOM readers' perception of review credibility was enhanced significantly with the increased information rating. However, the low-SOM readers showed a weak effect in this regard. Figs. 6 and 7 show that regardless of whether eWOM readers have high or low SOM, the effects of source credibility and information consistency on their perception of review credibility was maintained, which indicates that SOM did not have significant moderating effects on these two variables.
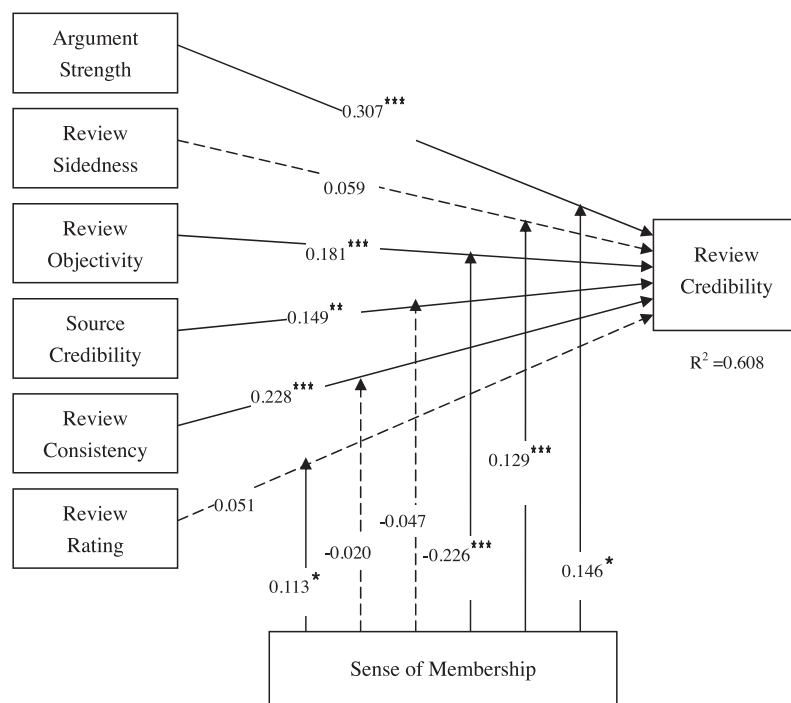

Fig. 2. Results of the research model. *Note*: $^*p < 0.05$, $^{**}p < 0.01$; $^{***}p < 0.001$, dotted line indicates insignificance.
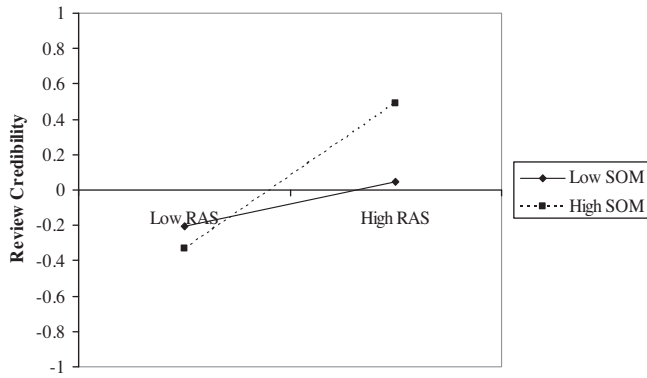
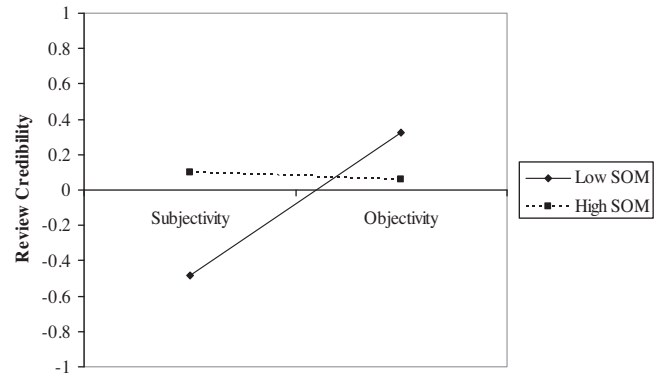**Fig. 3.** The moderating effect of SOM on RAS.

Fig. 5. The moderating effect of SOM on ROT.

6. Discussion

6.1. Discussion of results

This research systematically explores SOM's moderating effects on the causal relationship between eWOM antecedent factors and eWOM readers' perceptions of information credibility. First, we examined the main effect of the research model. The results showed that the full model explained 56.7% of the variance in perceptions of review credibility. We found that argument strength, review objectivity, source credibility, and review consistency significantly affected review credibility, which is consistent with the findings of previous research [8,47,50]. However, review sidedness and review rating were insignificant in the model, indicating that not all of the independent factors exert influence on the information recipients and that some may be invalid in certain contexts.

We then tested hypotheses H1–H6. We found that the positive effect of argument strength on review credibility was strengthened with the increase in SOM. This finding confirmed H1, which stated that the strong effect of argument strength on eWOM readers' perceptions of review credibility is not constant. To be more specific, we found that argument strength's effect on high-SOM eWOM readers was stronger than its effect on low-SOM readers. The results indicate that review sidedness does not have a strong effect on review credibility, which disconfirms Kamins et al.'s [23] finding but is consistent with the findings of Cheung et al. [8]. We think that a reason derived from our data analysis could help explain the inconsistent results of these prior studies: In the augmentation of the eWOM readers' SOM, the effect of review sidedness on their perceptions of review credibility was reinforced

(H2). Therefore, review sidedness can be a conditional factor affecting the cognition of information recipients. We found that SOM negatively moderated the causal relationship between review objectivity and review credibility, which confirmed H3 and suggested that the objective review's stronger effect on review credibility would be attenuated if the eWOM readers had strong SOM. These readers tend to treat the subjective and objective reviews equally; in contrast, readers with weak SOM would consider that objective reviews as credible than subjective reviews. The results of this study showed that SOM can positively moderate the effect of review rating on eWOM readers' perceptions of review credibility. This confirms H6 and implies that people with high SOM will utilize review ratings to evaluate the credibility of the review information, whereas for those people with low SOM, the effect on review credibility is insignificant. This study also revealed that the effects of source credibility and review consistency on eWOM readers' perceptions of review credibility were not moderated by eWOM readers' SOM, which does not support H4 and H5.

We predicted that review consistency and review rating would have similar effects on eWOM readers' perceptions of review credibility because both are social factors. However, the results did not confirm this prediction. To justify the reason that review consistency and review rating have different effects on the perceptions of eWOM readers, we interviewed 30 participants from the koubei and dianping forums. Among these participants, 15 had more than two years of experience (i.e., old timers) with one of the two forums, and the other 15 had less than two months of experience (i.e., newcomers) with one of the two forums (based on their answers in the questionnaire). We utilized one-way ANOVA to compare these two groups' SOM value. The result shows that the
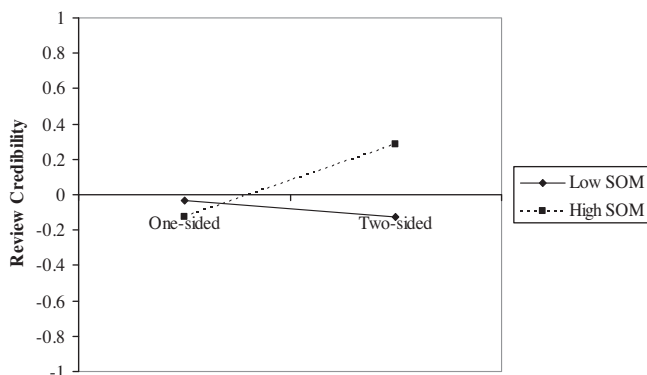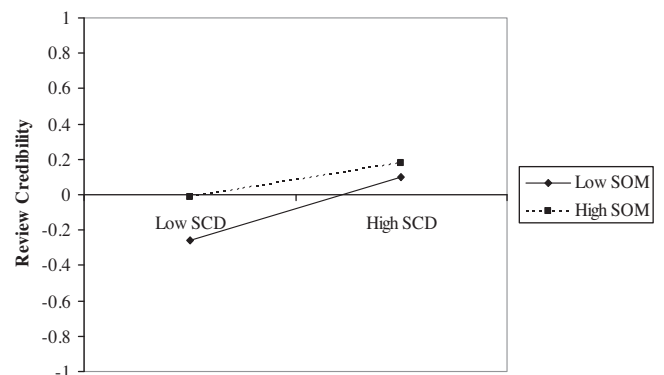

Fig. 4. The moderating effect of SOM on RSD.
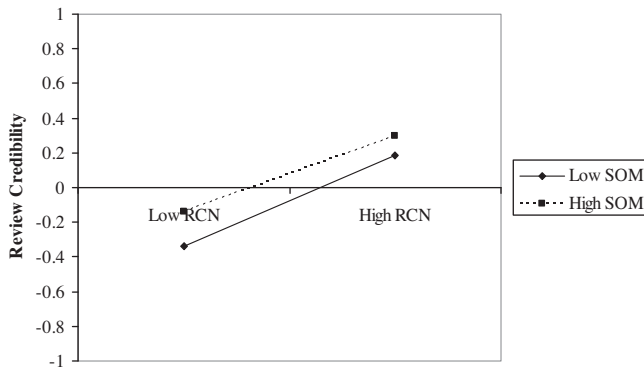

Fig. 6. The moderating effect of SOM on SCD.

Fig. 7. The moderating effect of SOM on RCN.

average SOM value of old timers is 5.19, whereas the value of newcomers is 2.10. The difference is significant with $F = 140.428$ and $p < 0.001$ and therefore, this result confirms that old timers have a higher SOM perception than do newcomers. We found the reasons in interviews with many of the participants with low SOM:

I do not think the reviews with a high rating are credible because I do not know why they endorse the review. Probably they have friends in that forum, so it leads me further to doubt that they endorse the review just because they are friends instead of the authenticity of the review. I also guess they do not have any field experience with the discussed product, so their endorsements are meaningless for me. If they really have field experience, they should write their own reviews. However, I tend to believe reviews that are consistent with other reviews, despite the fact that I am not a member of that community. I know it is a very famous and active forum, so I believe the administrators of the forum and most of the forum members cannot tolerate many spurious reviews on the forum because to do so will seriously affect the fame of the forum. In general, I do not think that the forum members would cheat me.

Many of the participants with high SOM said the following:

I like this forum. I often visit it and have many friends in it. I am familiar with the norms of this community, where members seldom violate these norms, so I think reviews that have a high rating or that are consistent with other reviews are credible.

The interviewees' responses helped us understand why the review rating did not have a primary effect on eWOM readers' perception of review credibility: eWOM readers with low SOM did
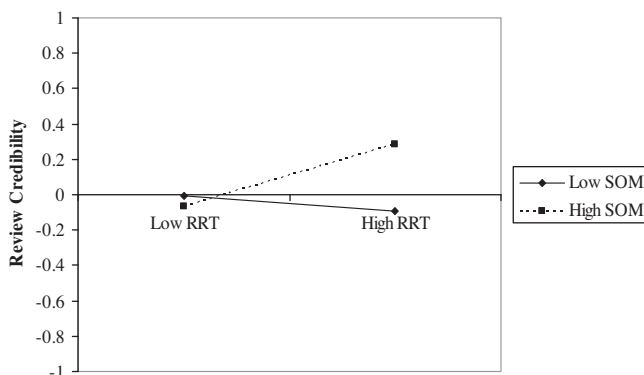

Fig. 8. The moderating effect of SOM on RRT.

not consider the review with a high rating to be credible and therefore it only serves as a conditional factor affecting readers' perceptions of review credibility. Such responses also explained why SOM moderated the relationship between review rating and review credibility but did not moderate the effect of review consistency on review credibility.

We also asked the participants with low SOM why they believed reviews composed by highly credible sources. The responses included the following:

I make source-credibility judgments based on two cues: member rankings awarded by the forum and behaviors (e.g., how many high-quality reviews the source has written) in the forum. In general, these two cues are correlated. I know this is a very famous forum; I believe that the forum administrators would not award high rankings to members who often provide false reviews.

These responses explain why SOM did not moderate the effect of source credibility on eWOM readers' perceptions of review credibility: eWOM readers, even with low SOM, continued to believe that the source credibility was authentic because of the forum's reputation.

6.2. Implications for research

This study has made several significant theoretical contributions. First, to the best of our knowledge, this is the first study to incorporate SOM into the eWOM research domain. We systematically explored the moderating effects of SOM on the causal relationships between eWOM antecedent factors and information credibility in two virtual communities. This research topic is consistent with the research orientation of previous eWOM studies [9,47], which indicates that the characteristics of information readers—such as their involvement and expertise levels, serve as moderators—instead of independent variables, in moderating the effects of eWOM antecedent factors on information readers' evaluations toward the information. This study validates that viewpoint because the analytical results confirmed four of the six hypotheses in our research model. The findings of this study may encourage future researchers to consider information readers' other characteristics. We believe that measuring the moderating effects of additional characteristics of information readers on information processing will advance the understanding of this research area.

Second, we found that SOM moderated the effects of all three of the central factors in eWOM readers' perceptions of review credibility in different moderating directions. This finding is interesting because it confirms that information readers with different levels of SOM are inclined to use different attributes of information content to evaluate eWOM information. Thus, the effects of various content-related factors were differentiated. Specifically, we found that argument strength had a direct effect on review credibility and SOM positively moderated this effect. Although review sidedness cannot significantly affect review credibility, SOM reinforced its effect. Furthermore, review objectivity had a direct effect on review credibility, whereas SOM attenuated this effect. These findings confirmed that these three content-related factors have different connotations and that manipulating them to be a single factor (i.e., information quality) is not a precise measurement. Therefore, separating information quality into different components and exploring the distinct effects of different components on the cognition of information readers is both necessary and important.

Third, the results of this study showed that SOM moderated only one peripheral factor's effect on review credibility. This finding is crucially important and intriguing for several reasons: First, we found that source credibility was a constant factor

affecting eWOM readers' perceptions of review credibility in well-known virtual communities. This is because the virtual community's good reputation had a strong persuasive effect on low-SOM information readers' evaluations of information source. However, with regard to the generalizability of our results, we are not sure whether source credibility would have a constant effect on information readers in unknown virtual communities. Thus, we suggest that further studies conduct a comparative study to investigate this unanswered question. Second, social factors have different effects on the perception of review credibility. This study found that SOM did not moderate the effect of review consistency on review credibility, whereas it found a significant moderating effect on the relationship between review rating and review credibility. This finding implies that low-SOM eWOM readers might follow the group's consensus under certain conditions (i.e., mass-following behavior). Our results showed that they tended to believe the information endorsed by a group of experienced members and dismissed the viewpoints of members without field experience.

In summary, our findings suggest that the application of SOM to eWOM research is valuable and has the potential to achieve significant results.

6.3. Implications for practice

This research also has important practical implications for eWOM communities and related companies that have adopted eWOM marketing strategies. The findings of this study could guide the implementation of precise eWOM marketing strategies that satisfy different members' information requirements. Because our findings demonstrated that SOM moderated many effects of eWOM antecedent factors on readers' perceptions of review credibility, we therefore suggest that eWOM communities and related companies design customized review recommendation systems to recommend different reviews to different readers, according to their SOM in virtual communities.

Regarding the design of such review recommendation systems for use by readers who have high SOM (community old timers), we make the following suggestions: Because the effects of argument strength on review credibility are strengthened with increasing SOM, eWOM practitioners should preferentially exhibit high-argument strength reviews in a prominent location on their initial web pages. Two-sided reviews should also be recommended to readers because the moderating effect of SOM on review sidedness is similar to its moderating effect on argument strength. Furthermore, both objective and subjective reviews can be recommended to readers because members with high SOM will treat them equally. Because both source credibility and review consistency have constant and positive effects on eWOM readers' perceptions of review credibility, regardless of their SOM, a review that is composed by a high-source credibility author or that is consistent with other reviews on the same topic should be displayed prominently on the site. Finally, the results indicate that the positive effect of review rating on review credibility occurs only under the condition of high SOM. Thus, we suggest placing highly rated reviews on the forums' web pages.

In the design of review recommendation systems for users who have low SOM (newcomers), eWOM practitioners should apply rigorous criteria in selecting the reviews: First, the results of this research revealed that objective reviews had a strong positive effect on low-SOM readers' perceptions of review credibility. Therefore, we recommend displaying objective reviews to these newcomers on the opening web page. As in the case of high SOM, we also recommend prominently displaying reviews that are composed by a high-source-credibility author or that are consistent with other reviews on the same topic. We do not suggest that eWOM practitioners recommend reviews with other characteristics to newcomers because our results indicate that those characteristics had no significant effect on low-SOM readers' perceptions of review credibility.

Furthermore, we recommend that eWOM practitioners pay close attention to changes in eWOM readers' SOM levels. When new readers frequently visit an eWOM community, their SOM toward the community will increase accordingly. Thus, eWOM practitioners should also make corresponding adjustments by providing different review recommendation systems to readers and follow their changes in SOM. In general, our results imply the effectiveness of a strategy of display customization. We suggest that eWOM practitioners design separate review recommendation systems with different review information aimed at different users according to their SOM. This would improve the effectiveness of the eWOM information and enhance both new and old eWOM readers' perceptions of satisfaction. Correspondingly, this would not only preserve and promote the prosperity of the forum but also help the related companies attract more consumers and boost their business performance.

6.4. Limitations

This study has the following limitations. First, data were collected from two leading eWOM forums (virtual communities) that focus on discussing various brick-and-mortar shops in China. Therefore, scholars should be cautious in generalizing the results of this study, which might vary across different virtual communities. We strongly suggest that future research investigate the SOM's moderating effects in other types of virtual communities. Second, because this study's sample was limited to China, the findings might not be applicable to other countries and/or cultures. Because previous research [44] empirically confirms that different national cultures induce different actions and attitudes online, applying our research model to other countries might also be an interesting research topic.

6.5. Conclusion

This research has determined the existence of new relationships among the factors that contribute to user perceptions of review credibility, which are a powerful driver in the decisions made by consumers in electronic commerce. By gaining a richer understanding of this environment, especially the nuances related to the moderating role of the "SOM" in previously established relationships, both researchers and practitioners could improve their pursuit of knowledge in this domain. Researchers could explore these relationships in new contexts and new cultural environments to improve the knowledge of this domain, and practitioners could implement systems that provide consumers with reviews that are tailored to the individual, instead of using a "one size fits all" approach. The important contributions made by this rigorous investigation serve to establish a foundation for important future work.

Appendix A. Constructs items

RAS	Item 1	The review arguments are convincing	Adapted from [51]
	Item 2	The review arguments are strong	
	Item 3	The review arguments are persuasive	
	Item 4	The review arguments are good	
	Item 5	The review information effectively supports its arguments	
	Item 6	The review arguments are reasonable	
RSD	Item 1	This review includes both pros and cons on the discussed target	Adapted from [8]
	Item 2	This review only has one-sided comments (positive or negative)	
	Item 3	This review is biased toward one side or the other	
	Item 4	This review includes both positive and negative comments	
ROT	Item 1	The argument of this review is unemotional	Adapted from [35]
	Item 2	This review is objective	
	Item 3	This review bases on the facts/attributes of the target	
SCD	Item 1	Based on the rating system of the review composer, this composer is reputable	Adapted from [47]
	Item 2	This review composer is reliable	
	Item 3	I think this review composer is trustworthy	
RCN	Item 1	The comments made in this review are consistent with other reviews	Adapted from [8]
	Item 2	The comments made in this review are similar to other reviews	
	Item 3	The comments made in this review match with other reviews	
RRT	Item 1	Based on the review rating, this review was found to be favorable by previous readers	Adapted from [8]
	Item 2	Based on the review rating, this review was highly rated by previous readers	
	Item 3	According to the review rating level, this review was good	
SOM	Item 1	I feel that I belong to this virtual community	Adapted from [26]
	Item 2	I feel membership in this virtual community	
	Item 3	I feel that the members of this virtual community are my close friends	
	Item 4	I like this virtual community's members	
RCRD	Item 1	This review is believable	Adapted from [45]
	Item 2	This review is factual	
	Item 3	This review is credible	
	Item 4	This review is trustworthy	

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