

# Do Others' Opinion Matter? Investigating the Impact of Gender Differences on Trustworthiness of e-WOM

Fei Liu  
Hong Kong Baptist  
University  
[fliu09@comp.hkbu.edu.hk](mailto:fliu09@comp.hkbu.edu.hk)

Bo Xiao  
University of Hawaii at  
Manoa  
[boxiao@hawaii.edu](mailto:boxiao@hawaii.edu)

Eric T.K. Lim  
University of New South  
Wales  
[e.t.lim@unsw.edu.au](mailto:e.t.lim@unsw.edu.au)

Chee-Wee Tan  
Copenhagen Business  
School  
[cta.itm@cbs.dk](mailto:cta.itm@cbs.dk)

## Abstract

*The maturing of Web 2.0 infrastructure fosters the rapid generation and dissemination of electronic word-of-mouth (e-WOM). The abundance of e-WOM allows online service providers to facilitate consumers' trust building. However, due to the often coexistence of two forms of e-WOM, namely numerical rating and opinionated review, consumers can perceive cognitive dissonance between the former and the latter. This cognitive dissonance can hinder the formation of consumers' trust and compel them to resolve the conflict. Guided by confirmation bias theory, we propose that, to maintain trusting beliefs when experiencing dissonance in e-WOM, male consumers value opinionated review over numerical rating and vice versa for their female counterparts. The results of our field survey on a custom developed website with 115 college students empirically validated our hypothesized relationships and also unveiled male's general bias towards opinionated review. Our findings can contribute to both research and practice.*

## 1. Introduction

Prior research has testified to the pivotal role of trust in determining individuals' evaluation of service providers across diverse online contexts, including e-commerce [25,28,43], e-government [5,60,66], e-health [1, 5], and e-banking [6]. Consumers who trust a service provider tend to regard the provider as being accessible and competent [26,54,55], culminating in desirable behaviors such as adoption [26,39] and retention [58,63]. Consequently, online service providers feel pressured to adopt a broad range of measures to build and maintain consumers' trust, which include offering warranties [2,69], establishing reputation [7,35], embracing third-party endorsements [2,7,64,69], and investing in advertisements [2,7].

The advent of the Web 2.0 infrastructure and the ensuing growth of electronic word-of-mouth (e-WOM) constitute an attractive option for service providers to foster consumers' trust in online contexts. By inducing *social presence*, e-WOM compensates for the lack of

social context and continuous reciprocity within online environments [29,56], thereby laying the foundation for online trust building efforts [28]. In addition, e-WOM possesses three major advantages that augment its trust building potential. First, e-WOM is often timely and relevant due to frequent updating [19,40,61]. Second, e-WOM tends to draw consumers' attention since it is deemed as a reliable source of information [33]. According to Channel Advisor [11], nearly 92% of consumers prefer to consult e-WOM when making purchases. Third, most consumers (i.e., 92.3%) deem e-WOM to be more trustworthy than information disseminated by service providers [18].

Despite the aforementioned advantages of e-WOM, irreconcilable discrepancy in its various forms may give rise to uncertainty and undermine its capacity for trust building. e-WOM often manifests in both *quantitative* (e.g., like/dislike or five-star rating), and *qualitative* (e.g., comments or written reviews) forms [47]. Previous studies have hinted at the distinction between *numerical rating* and *opinionated review*. Whereas *numerical rating* is a concise indicator of an individual's attitude towards a product or service [22], *opinionated review* supplies contextual information and reasoning behinds the individual's opinion. For this reason, *opinionated review* requires additional effort to process and leaves room for subjective interpretation [52,53]. According to *Cognitive Dissonance Theory* [14,20,21], potential conflicts between *numerical rating* and *opinionated reviews* are likely to contribute to cognitive strain [34], compelling individuals to engage in different conflict coping strategies in order to restore their internal consistency and trusting beliefs [20,21]. Few studies distinguish between *numerical rating* and *opinionated reviews* regarding their trust enhancing effect [59]. We thus seek to address this research gap by specifying the relationships between numerical rating as well as opinionated reviews and trust in the hosting website under the influence of potential cognitive dissonance.

Gender differences inherent to information processing and conflict coping has been advocated in previous studies [13,68]. Particularly, the *Theory of Confirmation Bias* holds that information should be

distinguished into two categories (i.e., *confirming information* and *disconfirming information*) according to whether the information confirms or disconfirms a decision maker's hypotheses [44,45]. Building on the *Theory of Confirmation Bias*, prior research found that when confronted with conflicting information, males tend to focus on confirming information whereas females are more likely to place emphasis on disconfirming information [13]. Nonetheless, there is a paucity of studies that investigated gender differences in conflict coping strategies when individuals are faced with incongruence in e-WOM [68].

Since prior research is largely concentrated on the volume, valence and dispersion of e-WOM [1], this study aims to extend extant literature by achieving three research goals: (1) introducing *numerical rating* and *opinionated review* as two distinctive forms of e-WOM that facilitate the formation of trusting beliefs; (2) investigating the negative influence posed by the perceived dissonance between *numerical rating* and *opinionated review* on trusting beliefs, and; (3) disentangling the impact of gender differences in coping with dissonance between *numerical rating* and *opinionated review*.

## 2. Theory Development

In the present study, we draw on *technology acceptance model* (TAM) as well as literature on *trust*, *social presence*, *cognitive dissonance*, and *confirmation bias* as our theoretical anchor.

### 2.1. Technology Acceptance Model and Trust

According to TAM, consumers' intention to adopt information technology (IT) (e.g., an online shopping website) is determined by two important beliefs: *perceived usefulness*, which refers to an individual's assessment of the utility of using an IT, and *perceived ease of use*, which is defined as an individual's estimation of the cognitive effort required to make use of an IT [26]. The relationships among the constructs of TAM [15,16] have been validated extensively in previous e-commerce research [26,27,28,36,54,62]. Accordingly, we hypothesize:

**Hypothesis 1:** A consumer's perceived usefulness of a website positively influences his/her intention to adopt this website.

**Hypothesis 2:** A consumer's perceived ease of use of a website positively influences his/her perceived usefulness of this website.

**Hypothesis 3:** A consumer's perceived ease of use of a website positively influences his/her intention to adopt this website.

*Trust* is the "belief that the trustee will act cooperatively to fulfill the trustor's expectations without exploiting its vulnerabilities" [54:123] on the basis of the *competence*, *integrity*, and *benevolence* of the trustee [26,54]. Specifically, competence refers to the "trustee's ability to perform as expected by the trustor" [54:123]. Integrity refers to the trustee's honesty in keeping his/her promises [54]. Finally, benevolence refers to the trustee's unwillingness to perform opportunistic behavior [54]. Prior e-commerce research has integrated trusting beliefs with TAM because neither *perceived usefulness* nor *perceived ease of use* enables consumers to rule out their concern about the other party's possible opportunistic behavior during economic transactions [26]. Therefore, trusting beliefs plays a critical role in enhancing consumers' intention to engage interactions and transactions on an e-commerce website [4,26,27,31,37,48]. Consumers' trust in an e-commerce website helps alleviate social uncertainty and determines the expected utility expected in business interactions [24], thus heightening the consumers' *perceived usefulness* of the website [26]. Moreover, due to the lowered social uncertainty, trusting consumers could invest less resources in monitoring the e-commerce website (or online vendor) and taking precautions to prevent loss from potential opportunistic behavior [24], and hence they may perceive higher *ease of use* of the website because of the lowered transaction cost [55]. We thus hypothesize:

**Hypothesis 4:** A consumer's trusting beliefs in a website positively influence his/her intention to adopt this website.

**Hypothesis 5:** A consumer's trusting beliefs in a website positively influence his/her perceived usefulness of this website.

**Hypothesis 6:** A consumer's trusting beliefs in a website positively influence his/her perceived ease of use of this website.

### 2.2. e-WOM and Trust

Trust building process is often hindered in an online setting due to the absence of a social context [29,38,56]. Social presence, which refers to "*the extent to which a medium allows users to experience others as being psychologically present*" [28:11], can be conveyed by e-commerce websites to compensate for the absence of social context, and enhance consumers' trust [28]. Prior research demonstrates that e-WOM is effective in inducing social presence and increase the

trustworthiness of a website. For instance, Dellarocas [17] as well as Gefen and Straub [28] showed that providing online consumer reviews helped e-commerce websites establish the trustworthiness of the websites. Pan and Chiou [51] found that cues from e-WOM conveyed the trustworthiness of the website better even though the reviewer was anonymous. Jabr and Zheng [33] demonstrated that information coming from peer consumers was more trustworthy than firm generated information. Furthermore, Lee et al. [41] testified the spill-over effect of trust in e-WOM onto the hosting website. In particular, they found that providing online consumer reviews on a retail website can significantly heighten consumers' trust in this website [41].

Prior research suggests that, when investigating the effect of online consumer review on trust, *numerical rating* should be distinguished from *opinionated review* [47]. Specifically, *numerical rating* often takes the form of ordinal rating (e.g., a certain number of stars out of five or ten). Because it is specific and concise, numerical rating can be especially effective when users wish to take a shortcut when making swift evaluations or decisions [22]. *Numerical rating* also caters to categorical thinking [42], and tends to positively influence users' trust in the website and decision making [41,59]. On the other hand, *opinionated review* is usually in the form of written comments, and it offers background information and contextual reasoning behind each reviewer's opinion. As a result, *opinionated review* requires more cognitive efforts to consume and also leaves room for personal interpretation [52,53]. Nonetheless, users often regard *opinionated review* as trustworthy [33] and this trust effect is spilled over to the website that hosts the reviews [41], especially for the users who are willing to inspect the arguments and rely more on their own interpretations [52,53]. We thus hypothesize:

**Hypothesis 7:** e-WOM in the form of numerical rating on a website positively influences a consumer's trusting beliefs in this website.

**Hypothesis 8:** e-WOM in the form of opinionated review on a website positively influences a consumer's trusting beliefs in this website.

### 2.3. Cognitive Dissonance

*Cognitive dissonance* refers to a situation where an individual faces conflicting attitudes, beliefs, or behaviors [14,20,21]. *Cognitive dissonance theory* posits that individuals strive to restore their internal consistency when confronted with conflicting information [14,20,21]. Particularly, if a website presents conflicting information, its users tend to resolve the dissonance by changing their attitudes

towards and beliefs about this website and regard it as untrustworthy [20,21].

*Numerical rating* is quantitative in nature whereas *opinionated review* consists of qualitative information. Moreover, while *numerical rating* represents an overall attitude, *opinionated review* contains detailed reasoning and opinions. It is not unusual for *numerical rating* and *opinionated review* to be inconsistent with each other, even when the two are consistent in valence. The discrepancy between *numerical rating* and *opinionated review*, when noticed by users, may be difficult for them to reconcile. Therefore, even though both *numerical rating* and *opinionated review* help establish the trustworthiness of a website [33,59] the dissonance between the two forms of e-WOM may undermine their positive influence on trust. This adverse effect on trust likely spills over to the hosting website [41], especially when both forms are compiled and highlighted by the website. We thus hypothesize:

**Hypothesis 9:** A consumer's perceived cognitive dissonance between numerical rating and opinionated review on a website negatively influences his/her trusting beliefs in this website.

### 2.4. Gender Difference in Confirmation Bias

One of the fundamental gender differences identified in extent psychology and cognition literature is that males are driven by agentic goals whereas females follow communal goals [9,10]. In other words, while males tend to maintain self-esteem and pursue personal achievements, females are concerned more with collective welfare and harmony [13]. This gender difference in ego functioning leads to difference in *confirmation bias* between male and female [45].

According to *confirmation bias theory* [45], information can either helps confirm decision makers' hypotheses or disconfirm them. The co-occurrence of two (potentially inconsistent) pieces of information heightens decision makers' cognitive stress and results in different coping strategies in accordance with genders. More specifically, male decision makers tend to lean towards information that confirms their own hypotheses yet disregard information that invalidates their hypotheses due to their natural tendency to maintain agency and self-esteem [13]. On the other hand, female decision makers care less about validating their own hypotheses; rather, they seek to minimize discrepancy in opinions by paying attention to information that disconfirms their hypotheses [13].

The *numerical rating* and *opinionated review* tend to disconfirm and confirm consumers' hypotheses correspondingly. Specifically, *numerical rating* is an overall indication of a reviewer's personal attitude

[22]. Consequently, consumers who seek information that disconfirms their hypotheses are likely to focus on *numerical rating* because they value dissenting opinions over contextual justification. We therefore posit hypothesis *disconfirming* as the prevalent nature of *numerical rating*. On the other hand, *opinionated review* often provides facts and reasoning behind a reviewer's opinion thus opens up rooms for consumers' selection and interpretation [52,53]. Therefore consumers who aim to confirm their own hypotheses often find supporting evidence from *opinionated review*. Hence we posit hypothesis *confirming* as the predominant nature of *opinionated review*.

Due to the contrasting characteristics of *numerical rating* and *opinionated review* in confirming or disconfirming consumers' own hypotheses respectively, we expect that the consumers will prefer one form to the other when perceiving cognitive dissonance between these two forms of e-WOM. Particularly, when encountering discrepancy between *numerical rating* and *opinionated review*, male consumers will shift their attention to the latter while discrediting the former. In this case, the positive influence of *opinionated review* on trusting beliefs should be enhanced while the relationship between *numerical rating* and trusting beliefs should be attenuated. On the contrary, when faced with inconsistent *numerical rating* and *opinionated review*, female consumers are likely to focus on the former as a conflict coping strategy. As a result, perceived cognitive dissonance between *numerical rating* and *opinionated review* can strengthen the positive effect of *numerical rating* on female consumers' trusting beliefs yet mitigate the positive relationship between *opinionated review* and female consumers' trusting beliefs. We thus hypothesize

**Hypothesis 10a-b:** For a (a) male or (b) female consumer, their perceived cognitive dissonance between numerical rating and opinionated review on a website (a) attenuates or (b) facilitates the positive relationship between numerical rating and their trusting beliefs in this website.

**Hypothesis 11a-b:** For a (a) male or (b) female consumer, their perceived cognitive dissonance between numerical rating and opinionated review on a website (a) facilitates or (b) attenuates the positive relationship between opinionated review and their trusting beliefs in this website.

### 3. Methodology

To empirically validate the hypotheses in our research model, we conducted a field survey on a customized online restaurant review website. We believe this website can help respondents to familiarize with both *numerical rating* and *opinionated review* and alleviate the challenges for them to recall their experience with e-WOM when answering questions in the questionnaire. To ensure the realism of this custom-made website, we extracted over 268,000 real online consumer reviews posted by nearly 91,000 diners for 1,079 restaurants in the San Francisco area through web scraping and populate our website with this collected data.

#### 3.1. Development of Survey Measures

We developed the measurement items for both numerical rating and opinionated review for this study in according with established psychometric procedures [46]. Measures for constructs in TAM, including *perceived usefulness*, *perceived ease of use*, and *adoption intention*, were adapted from prior research [26]. Likewise, measures for the three dimensions of trusting belief were elicited from Wang and Benbasat's study [65]. Lastly, measurement items for *cognitive dissonance* were also obtained from prior literature [21]. Table 1 depicts all measurement items along with their properties for this study.

Construct	Reflective Measures	Mean (S.D.)	Item Loading
Numerical Rating (NR)	The online review website provides <b>numerical ratings</b> assigned by other consumers for each restaurant featured on the site.	5.46 (1.50)	0.88 [M:0.87] [F:0.89]
	The online review website provides <b>numerical scores</b> assigned by other consumers for each restaurant featured on the site.	5.05 (1.62)	0.94 [M:0.95] [F:0.94]
	The online review website provides <b>numerical values</b> assigned by other consumers for each restaurant featured on the site.	5.06 (1.56)	0.93 [M:0.90] [F:0.95]
Opinionated Review (OR)	The online review website provides <b>other consumers' comments</b> for each restaurant featured on the site.	5.85 (1.19)	0.91 [M:0.87] [F:0.93]

	The online review website provides <b>other consumers' feedback</b> for each restaurant featured on the site.	5.86 (1.16)	0.89 [M:0.84] [F:0.93]
	The online review website provides <b>other consumers' impressions</b> for each restaurant featured on the site.	5.77 (1.26)	0.89 [M:0.84] [F:0.93]
	The online review website provides <b>other consumers' opinions</b> for each restaurant featured on the site.	5.88 (1.14)	0.92 [M:0.87] [F:0.95]
	The online review website provides <b>other consumers' views</b> for each restaurant featured on the site.	5.86 (1.15)	0.88 [M:0.75] [F:0.95]
Cognitive Dissonance (CD)	Ratings and reviews on the online review website are <b>inconsistent with one another</b> .	2.69 (1.31)	0.94 [M:0.94] [F:0.94]
	Ratings and reviews on the online review website are <b>conflicting with one another</b> .	2.77 (1.19)	0.90 [M:0.91] [F:0.90]
Competence (CO)	The online review website is capable in providing reviews about restaurants.	5.72 (1.30)	0.88 [M:0.92] [F:0.86]
	The online review website is competent in providing reviews about restaurants.	5.62 (1.36)	0.95 [M:0.93] [F:0.96]
	The online review website is proficient in providing reviews about restaurants.	5.52 (1.45)	0.93 [M:0.92] [F:0.96]
	The online review website knows what it is doing.	5.35 (1.58)	0.85 [M:0.80] [F:0.88]
Benevolence (BE)	The online review website puts my interests first.	5.17 (1.26)	0.92 [M:0.93] [F:0.92]
	The online review website keeps my interests in mind.	5.28 (1.22)	0.95 [M:0.94] [F:0.96]
	The online review website wants to understand my needs and preferences.	5.30 (1.34)	0.92 [M:0.93] [F:0.92]
Integrity (IN)	The online review website provides unbiased reviews about restaurants.	4.98 (1.45)	0.87 [M:0.85] [F:0.87]
	The online review website is honest.	5.15 (1.30)	0.94 [M:0.92] [F:0.95]
	The online review website possesses integrity.	5.09 (1.20)	0.92 [M:0.92] [F:0.92]
Perceived Usefulness (PU)	Using the online review website increases the effectiveness of my decision making process.	5.41 (1.45)	0.97 [M:0.97] [F:0.98]
	Using the online review website improves the	5.31 (1.52)	0.97 [M:0.96]

	performance of my decision making process.		[F:0.98]
	Overall, the online review website is useful towards my decision making process.	5.47 (1.45)	0.98 [M:0.97] [F:0.98]
Perceived Ease of Use (PE)	Using the online review website enables me to quickly decide on which restaurant to visit.	5.19 (1.48)	0.85 [M:0.92] [F:0.79]
	The online review website is easy to use.	5.28 (1.58)	0.94 [M:0.93] [F:0.94]
	It is easy to become skillful at utilizing the online review website.	5.44 (1.45)	0.96 [M:0.96] [F:0.95]
	Learning to operate the online review website is easy.	5.50 (1.48)	0.91 [M:0.93] [F:0.88]
Adoption Intention (AD)	I am willing to utilize the online review website to help with my decisions about which restaurant to visit.	5.55 (1.37)	0.95 [M:0.95] [F:0.96]
	I am willing to let the online review website assist me in deciding which restaurant to visit.	5.44 (1.49)	0.96 [M:0.96] [F:0.97]
	I am willing to rely on the online review website in deciding which restaurant to visit.	5.32 (1.45)	0.95 [M:0.97] [F:0.95]

### 3.2. Field Survey Procedures

At the start of each survey session, respondents were asked to provide their demographic information. They were then directed to our online review website and instructed to complete a well-structured, goal-oriented restaurant selection task (i.e., selecting a restaurant for a friend) and an unstructured exploratory restaurant selection task (i.e., selecting a restaurant for yourself) [8,49] (see Appendix A for the task scenarios). Respondents were asked to make their selection on the basis of the *numerical ratings* and *opinionated reviews* available for each restaurant. Upon the completion of both tasks, respondents were presented with an online survey questionnaire that measures their perceptions with regards to the provision of *numerical rating* and *opinionated review*, the *cognitive dissonance* between the former and the latter, their trusting beliefs in the website, as well as their perceived usefulness, perceived ease of use, and adoption intention towards the website. 115 undergraduate students and staffs from a large university in the United States participated in the field survey. Table 2 summarizes descriptive statistics of the sample.

**Table 2. Respondent Demographics [N = 115]**

Demographic	Number	Percentage
<b>Gender</b>		
Male	57	49.6%
Female	58	50.4%
<b>Age</b>		
Age 19 to 29	83	72.2%
Age 30 to 49	23	20.0%
Age 50 to 64	8	7.0%
Age 65+	1	0.9%
<b>Education</b>		
Less than college education	14	12.2%
College education or higher	100	87.0%
Unwilling to disclose	1	0.9%
<b>Income</b>		
\$0 to \$30,000	79	68.7%
\$30,000+ to \$50,000	16	13.9%
\$50,000+ to \$75,000	8	7.0%
\$75,000+	5	4.3%
Unwilling to disclose	7	6.1%

### 3.3. Measurement Model

As the data in our study were collected via a single survey questionnaire, common method bias could be a potential threat to the internal validity of the study. To reduce the concern for common method bias, we conducted the one-factor extraction test suggested by Harman [30] by performing exploratory factor analysis (EFA) of the 31 variables. Five salient components with eigenvalues greater than 1.00 emerged with no single factor accounting for more than 50% of the total variance explained [57], suggesting that our data analysis is unlikely to be plagued by common method bias.

To validate our measurement model, we assessed individual item reliability, internal consistency, as well as the convergent and discriminant validity of all survey measures. Item reliability was evaluated by the loadings of the measures with their corresponding construct. Since all loadings exceed 0.7, satisfactory item reliability is ensured (see Table 1). Internal consistency was examined by ensuring that Cronbach's alpha, composite reliability and the Average Variance Extracted (AVE) meet established criteria [23,50]. Results indicate good internal consistency by showing that all three aforementioned indicators of each construct surpass recommended thresholds (see Table 3). Furthermore, we found that the square root of AVE of every construct in the measurement model is greater than the correlations of the construct with every other construct (see Table 4). Besides, through a careful examination of the loading and cross-loading matrix, no item loads higher on a construct than on the one it

intends to measure. These statistics suggest adequate convergent validity and discriminate validity.

**Table 3. Internal Consistency [N = 115]**

Construct	Cronbach's $\alpha$ [> 0.70]	CR [> 0.70]	AVE [>0.50]
Numerical Rating (NR)	0.91 [M:0.89] [F:0.92]	0.94 [M:0.93] [F:0.95]	0.84 [M:0.82] [F:0.86]
Opinionated Review (OR)	0.94 [M:0.89] [F:0.97]	0.95 [M:0.92] [F:0.97]	0.81 [M:0.70] [F:0.88]
Cognitive Dissonance (CD)	0.82 [M:0.83] [F:0.82]	0.92 [M:0.92] [F:0.92]	0.85 [M:0.86] [F:0.85]
Competence (CO)	0.93 [M:0.92] [F:0.93]	0.95 [M:0.94] [F:0.95]	0.82 [M:0.80] [F:0.84]
Benevolence (BE)	0.93 [M:0.93] [F:0.93]	0.95 [M:0.95] [F:0.95]	0.87 [M:0.87] [F:0.87]
Integrity (IN)	0.89 [M:0.88] [F:0.90]	0.93 [M:0.92] [F:0.94]	0.82 [M:0.80] [F:0.84]
Perceived Usefulness (PU)	0.97 [M:0.96] [F:0.98]	0.98 [M:0.98] [F:0.99]	0.94 [M:0.93] [F:0.96]
Perceived Ease of Use (PE)	0.93 [M:0.95] [F:0.92]	0.95 [M:0.97] [F:0.94]	0.84 [M:0.87] [F:0.80]
Adoption Intention (AI)	0.95 [M:0.96] [F:0.95]	0.97 [M:0.97] [F:0.97]	0.91 [M:0.92] [F:0.92]

**Table 4. Inter-Construct Correlation Matrix [N = 115]**

	NR	OR	CD	CO	BE	IN	PU	PE	AI
NR	0.92								
OR	0.46	0.90							
CD	-0.52	-0.57	0.92						
CO	0.35	0.42	-0.44	0.91					
BE	0.37	0.37	-0.47	0.70	0.93				
IN	0.30	0.42	-0.49	0.65	0.69	0.91			
PU	0.38	0.34	-0.46	0.75	0.73	0.63	0.97		
PE	0.43	0.42	-0.52	0.77	0.70	0.63	0.88	0.92	
AI	0.36	0.38	-0.46	0.77	0.71	0.67	0.90	0.86	0.95

### 3.4. Structure Model

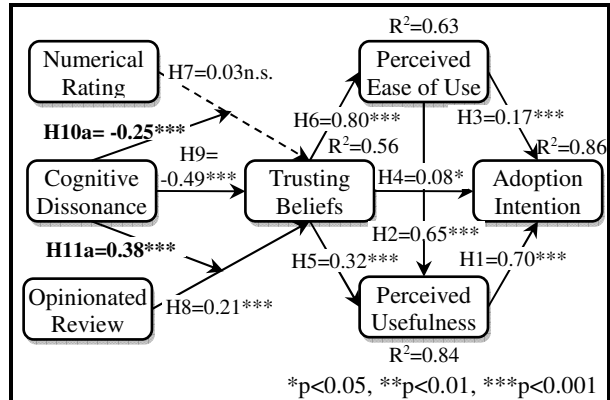
Partial Least Square (SmartPLS 2.0 M3) was employed to validate our structure model [12]. PLS analysis allows us to simultaneously analyze the direction as well as the strength of each hypothesized relationship [67].

In order to validate our hypotheses pertaining to gender difference, we split our data set according to respondents' gender and tested the structure model with male and female samples respectively. Figure 1 and Figure 2 illustrate the testing results for male and female respondents correspondingly. For both male and female, both *perceived usefulness* and *perceived ease of use* partially mediate the positive relationship between trusting beliefs and adoption intention, thus supporting Hypothesis 1 and 3 to 6. Hypothesis 2 is also validated because *perceived ease of use* exerts positive influence on *perceived usefulness*. Likewise, the positive relationship between *opinionated review* and trusting beliefs as well as the negative relationship between *cognitive dissonance* and trusting beliefs hold for both genders, thereby corroborating Hypothesis 8 and 9. However, Hypothesis 7 is only partially supported because the positive relationship between numerical rating and trusting beliefs is non-significant for male respondents. Last but not least, both Hypothesis 10 and 11 are validated since the three-way interaction among e-WOM form, *cognitive dissonance* and gender is clearly depicted in Figure 1 and Figure 2. Particularly, for male respondents, *cognitive dissonance* between *numerical rating* and *opinionated review* reinforces the latter's positive influence on trusting beliefs yet deters the positive relationship between the former and trusting beliefs. However, the moderating effects posed by *cognitive dissonance* between *numerical rating* and *opinionated review* on both former and latter are reversed for female respondents.

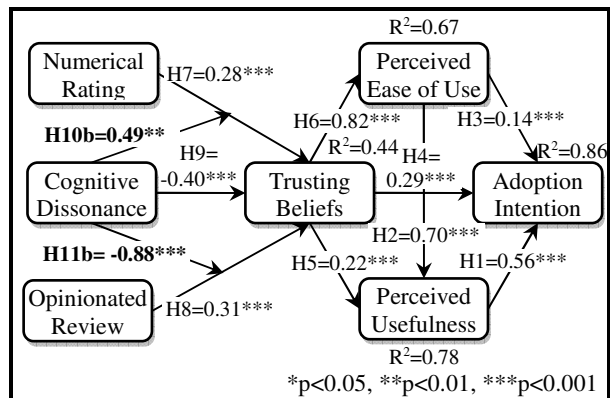
#### 4. Discussion

In this study, we extend the well-established trust and TAM framework in the e-commerce context by investigating the effects of distinct forms of e-WOM (i.e., *numerical rating* and *opinionated review*) and their dissonance on the formation of consumers' trusting beliefs in a website. More importantly, we explicated how consumers of different genders cope with such dissonance by concentrating on one form of e-WOM while disregarding the other one. Our findings from a field survey showed that while all relationships in the trust and TAM framework hold for both male and female, they tend to adopt opposing coping strategies to resolve dissonance between *numerical rating* and *opinionated review*. We discovered that male consumers focus on the more confirming *opinionated review* rather than the more disconfirming *numerical rating* and vice versa for their female counterparts. Interestingly, for male consumers, only *opinionated review* exerts significant positive influence on their trusting beliefs. This suggests that male's

tendency towards hypothesis confirming overshadows any perceptions of dissonance between *numerical rating* and *opinionated review*. This finding is consistent with the findings in prior literature that male decision makers usually exhibit a propensity for hypothesis confirming yet their female counterpart does not [13].



**Figure 1. Results of the Structure Model Analysis for Males [N = 57]**



**Figure 2. Results of the Structure Model Analysis for Females [N = 58]**

#### 4.1. Theoretical and Managerial Implication

The present study contributes to extant e-WOM literature in several ways. First, this study draws from *confirmation bias theory* [45] and delineates between *numerical rating* from *opinionated review* as two distinct forms of e-WOM on the basis of their disconfirming and confirming nature respectively. In doing so, we are able to articulate male and female's inherent bias towards various forms of e-WOM. For instance, male consumers lean towards opinionated review whereas their female counterpart treats both forms in a relatively equal fashion. Second, our delineation between *numerical rating* and *opinionated*

*review* allows us to explore the adverse impact caused by perceived *cognitive dissonance* between the former and the latter on ensuring consumers' trusting beliefs in a website from the perspective of *cognitive dissonance theory* [14,20,21]. Our findings attest to *cognitive dissonance* as a hindrance to consumers' trust building towards a website across both genders. Third, guided by male and female's distinct focuses on agency and communion as well as *confirmation bias theory* [45] this study unveils the contrasting coping strategies adopted by male and female when perceiving *cognitive dissonance* between *numerical rating* and *opinionated review*. More particularly, male consumers tend to shift their emphasis away from *numerical rating* to *opinionated review* and vice versa for their female counterpart.

Our findings can also offer guidelines for practitioners to optimize the benefits e-WOM by personalizing the provision of its two forms in accordance with consumers' genders. First, in order to cater to male consumers' tendency towards confirming their own hypotheses, we suggest the practitioners to prioritize the provision of *opinionated review* for them. Second, the adverse effect of *cognitive dissonance* on trust building helps practitioners to realize the potential drawbacks of providing both *numerical rating* and *opinionated review* at the same time. Third, this study sensitizes practitioners to the importance of highlighting *opinionated review* for male consumers and *numerical rating* for female consumers respectively to facilitate their contrasting strategies for conflict coping.

#### 4.2. Limitations

The present study is not without its limitations. First, to maintain the parsimony of our research model while acknowledging the existence of many other characteristics of e-WOM in prior literature, such as volume, valence, and dispersion [1], we chose to focus on the two forms of e-WOM: *numerical rating* and *opinionated review*. Nonetheless, we encourage future studies to investigate the influence of a comprehensive collection of e-WOM properties. Second, the majority of our respondents are college students. Although student sample is suitable for e-WOM research [43], further studies can be conducted to validate our hypothesized relationships with a more diverse sample, which in turn bolster the external validity of our findings. Third, due to the cross-sectional nature of this survey study, spurious inferences for causal effect may exist.

## 5. Appendix A

### Task 1: Find a restaurant for your friend's birthday dinner

Scenario: You are planning to visit your best friend, Peter, who lives in the Russian Hill area of San Francisco and likes New American food, next Saturday. Peter will be having his birthday on the same day. You plan to surprise Peter during your visit by bringing him to a nice New American restaurant to celebrate his birthday.

Because you are unfamiliar with the area around Russian Hill, you decide to turn to TasteSF, a newly set up online review website for restaurants in San Francisco, to choose an American (NEW) restaurant in the Russian Hill area.

### Task 2: Find a restaurant for yourself

You are taking a trip to San Francisco next Saturday. You would like to enjoy a meal alone in a nice restaurant. Because you are unfamiliar with San Francisco, you decide to turn to TasteSF, a newly set up online review website for restaurants in San Francisco, to choose a restaurant you prefer.

## 6. References

- [1] Aggarwal, R., Gopal, R., Gupta, A., and Singh, H. Putting money where the mouths are: The relation between venture financing and electronic word-of-mouth. *Information Systems Research* 23, 3-part-2 (2012), 976–992.
- [2] Aiken, K.D. and Boush, D.M. Trustmarks, objective-source ratings, and implied investments in advertising: investigating online trust and the context-specific nature of internet signals. *Journal of the Academy of Marketing Science* 34, 3 (2006), 308–323.
- [3] Andreassen, H.K., Bujnowska-Fedak, M.M., Chronaki, C.E., et al. European citizens' use of E-health services: a study of seven countries. *BMC public health* 7, 1 (2007), 53.
- [4] Bart, Y., Shankar, V., Sultan, F., and Urban, G.L. Are the drivers and role of online trust the same for all web sites and consumers? A large-scale exploratory empirical study. *Journal of marketing* 69, 4 (2005), 133–152.
- [5] Bélanger, F. and Carter, L. Trust and risk in e-government adoption. *The Journal of Strategic Information Systems* 17, 2 (2008), 165–176.
- [6] Benamati, J., Serva, M.A., and Fuller, M.A. Are trust and distrust distinct constructs? An empirical study of the effects of trust and distrust among online banking users. *System Sciences, 2006. HICSS'06.*



- Proceedings of the 39th Annual Hawaii International Conference on, IEEE* (2006), 121b–121b.
- [7] Biswas, D. and Biswas, A. The diagnostic role of signals in the context of perceived risks in online shopping: do signals matter more on the web? *Journal of Interactive Marketing*, (2004).
- [8] Browne, G.J., Pitts, M.G., and Wetherbe, J.C. Cognitive stopping rules for terminating information search in online tasks. *MIS quarterly*, (2007), 89–104.
- [9] Carlson, R. Sex differences in ego functioning: Exploratory studies of agency and communion. (1971).
- [10] Carlson, R. Understanding women: Implications for personality theory and research. *Journal of Social Issues* 28, 2 (1972), 17–32.
- [11] ChannelAdvisor. *Through the Eyes of the Consumer: 2010 Consumer Shopping Habits Survey*. 2010.
- [12] Chin, W.W. *Commentary: Issues and opinion on structural equation modeling*. 1998.
- [13] Chung, J. and Monroe, G. Gender differences in information processing: an empirical test of the hypothesis-confirming strategy in an audit context. *Accounting & Finance* 38, 2 (1998), 265–279.
- [14] Cooper, J. *Cognitive dissonance: 50 years of a classic theory*. Sage, 2007.
- [15] Davis, F.D., Bagozzi, R.P., and Warshaw, P.R. Extrinsic and intrinsic motivation to use computers in the workplace. *Journal of applied social psychology* 22, 14 (1992), 1111–1132.
- [16] Davis, F.D. Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS quarterly*, (1989), 319–340.
- [17] Dellarocas, C. The digitization of word of mouth: Promise and challenges of online feedback mechanisms. *Management science* 49, 10 (2003), 1407–1424.
- [18] eMarketer. *Moms Place Trust in Other Consumers*. 2010. <http://www.emarketer.com/Article/Moms-Place-Trust-Other-Consumers/1007509>.
- [19] Ertimur, B. and Gilly, M.C. So whaddya think? Consumers create ads and other consumers critique them. *Journal of Interactive Marketing* 26, 3 (2012), 115–130.
- [20] Festinger, L. *A theory of cognitive dissonance*. Stanford university press, 1962.
- [21] Festinger, L. Cognitive dissonance theory. *R. West and L.H. Turner, Introducing communication Theory Analysis and Application* 4, (2010), 112–128.
- [22] Fiske, S.T. and Taylor, S.E. *Social cognition: From brains to culture*. Sage, 2013.
- [23] Fornell, C. and Larcker, D.F. Evaluating structural equation models with unobservable variables and measurement error. *Journal of marketing research*, (1981), 39–50.
- [24] Fukuyama, F. *Trust: The social virtues and the creation of prosperity*. Free press New York, 1995.
- [25] Gefen, D., Karahanna, E., and Straub, D.W. Inexperience and experience with online stores: the importance of TAM and trust. *Engineering Management, IEEE Transactions on* 50, 3 (2003), 307–321.
- [26] Gefen, D., Karahanna, E., and Straub, D.W. Trust and TAM in online shopping: An integrated model. *MIS quarterly* 27, 1 (2003), 51–90.
- [27] Gefen, D. and Straub, D.W. Managing user trust in B2C e-services. *E-service Journal* 2, 2 (2003), 7–24.
- [28] Gefen, D. and Straub, D.W. Consumer trust in B2C e-Commerce and the importance of social presence: experiments in e-Products and e-Services. *Omega* 32, 6 (2004), 407–424.
- [29] Gefen, D. E-commerce: the role of familiarity and trust. *Omega* 28, 6 (2000), 725–737.
- [30] Harman, H.H. *Modern factor analysis*. University of Chicago Press, 1976.
- [31] Van der Heijden, H., Verhagen, T., and Creemers, M. Understanding online purchase intentions: contributions from technology and trust perspectives. *European journal of information systems* 12, 1 (2003), 41–48.
- [32] Hesse, B.W., Nelson, D.E., Kreps, G.L., et al. Trust and sources of health information: the impact of the Internet and its implications for health care providers: findings from the first Health Information National Trends Survey. *Archives of internal medicine* 165, 22 (2005), 2618–2624.
- [33] Jabr, W. and Zheng, E. Know yourself and know your enemy: An analysis of firm recommendations and consumer reviews in a competitive environment. *Jabr, Wael and Eric Zheng. "Know Yourself and Know Your Enemy: An Analysis of Firm Recommendations and Consumer Reviews in a Competitive Environment". MIS Quarterly. Accepted July, (2013)*.
- [34] Kahneman, D. *Attention and effort*. Citeseer, 1973.
- [35] Kim, H.-W., Xu, Y., and Koh, J.A. A comparison of online trust building factors between potential customers and repeat customers. *Journal of the Association for Information Systems* 5, 10 (2004), 13.
- [36] Kim, J.B. An empirical study on consumer first purchase intention in online shopping: integrating initial trust and TAM. *Electronic Commerce Research* 12, 2 (2012), 125–150.
- [37] Koh, T.K., Fichman, M., and Kraut, R.E. Trust across borders: Buyer-supplier trust in global Business-to-Business e-commerce. *Journal of the association for information systems* 13, 11 (2012), 886–922.
- [38] Kollock, P. The economies of online cooperation. *Communities in cyberspace* 220, (1999).
- [39] Komiak, S.Y.X. and Benbasat, I. The Effects of Personalization and Familiarity on Trust and Adoption

- of Recommendation Agents. *MIS Quarterly* 30, 4 (2006), 941–960.
- [40] Lawrence, B., Fournier, S., and Brunel, F. When Companies Don't Make the Ad: A Multimethod Inquiry Into the Differential Effectiveness of Consumer-Generated Advertising. *Journal of Advertising* 42, 4 (2013), 292–307.
- [41] Lee, M., Rodgers, S., and Kim, M. Effects of valence and extremity of eWOM on attitude toward the brand and website. *Journal of Current Issues & Research in Advertising* 31, 2 (2009), 1–11.
- [42] Macrae, C.N. and Bodenhausen, G. V. Social cognition: Categorical person perception. *British Journal of Psychology* 92, 1 (2001), 239–255.
- [43] McKnight, D.H., Choudhury, V., and Kacmar, C. Developing and validating trust measures for e-commerce: an integrative typology. *Information systems research* 13, 3 (2002), 334–359.
- [44] Meyers-Levy, J. and Maheswaran, D. Exploring differences in males' and females' processing strategies. *Journal of Consumer Research*, (1991), 63–70.
- [45] Meyers-Levy, J. Gender differences in information processing: A selectivity interpretation. 1986.
- [46] Moore, G. and Benbasat, I. Development of an instrument to measure the perceptions of adopting an information technology innovation. *Information systems research*, (1991).
- [47] Mudambi, S. and Schuff, D. What makes a helpful review? A study of customer reviews on Amazon. com. *MIS quarterly*, (2010).
- [48] Mukherjee, A. and Nath, P. Role of electronic trust in online retailing. *European Journal of Marketing* 41, 9/10 (2007), 1173–1202.
- [49] Nadkarni, S. and Gupta, R. A task-based model of perceived website complexity. *Mis Quarterly*, (2007).
- [50] Nunnally, J.C. and Bernstein, I.H. Psychometric theory. *New York McGraw-Hill*, (1994).
- [51] Pan, L.-Y. and Chiou, J.-S. How much can you trust online information? Cues for perceived trustworthiness of consumer-generated online information. *Journal of Interactive Marketing* 25, 2 (2011), 67–74.
- [52] Park, D.H. and Kim, S. The effects of consumer knowledge on message processing of electronic word-of-mouth via online consumer reviews. *Electronic Commerce Research and Applications* 7, 4 (2008), 399–410.
- [53] Park, D.H. and Lee, J.M. eWOM overload and its effect on consumer behavioral intention depending on consumer involvement. *Electronic Commerce Research and Applications* 7, 4 (2008), 386–398.
- [54] Pavlou, P.A. and Fygenson, M. Understanding and predicting electronic commerce adoption: An extension of the theory of planned behavior. *MIS Quarterly* 30, 1 (2006), 115–143.
- [55] Pavlou, P.A. Consumer acceptance of electronic commerce: Integrating trust and risk with the technology acceptance model. *International journal of electronic commerce* 7, 3 (2003), 101–134.
- [56] Reichheld, F.F. and Scheffer, P.E. loyalty. *Harvard business review* 78, 4 (2000), 105–113.
- [57] Schriesheim, C.A. The similarity of individual directed and group directed leader behavior descriptions. *Academy of Management Journal* 22, 2 (1979), 345–355.
- [58] Sirdeshmukh, D., Singh, J., and Sabol, B. Consumer trust, value, and loyalty in relational exchanges. *Journal of marketing* 66, 1 (2002), 15–37.
- [59] Sparks, B.A. and Browning, V. The impact of online reviews on hotel booking intentions and perception of trust. *Tourism Management* 32, 6 (2011), 1310–1323.
- [60] Tan, C.-W., Benbasat, I., and Cenfetelli, R.T. Building citizen trust towards e-government services: do high quality websites matter? *Hawaii International Conference on System Sciences, Proceedings of the 41st Annual, IEEE* (2008), 217.
- [61] Thompson, D. V and Malaviya, P. Consumer-Generated Ads: Does Awareness of Advertising Co-Creation Help or Hurt Persuasion? *Journal of Marketing* 77, 3 (2013), 33–47.
- [62] Ulbrich, F., Christensen, T., and Stankus, L. Gender-specific on-line shopping preferences. *Electronic Commerce Research* 11, 2 (2011), 181–199.
- [63] Valvi, A.C. and Fragkos, K.C. Critical review of the e-loyalty literature: a purchase-centred framework. *Electronic Commerce Research* 12, 3 (2012), 331–378.
- [64] Wang, S., Beatty, S.E., and Foxx, W. Signaling the trustworthiness of small online retailers. *Journal of interactive marketing* 18, 1 (2004), 53–69.
- [65] Wang, W. and Benbasat, I. Trust In and Adoption of Online Recommendation Agents. *J AIS* 6, 3 (2005).
- [66] Warkentin, M., Gefen, D., Pavlou, P.A., and Rose, G.M. Encouraging citizen adoption of e-government by building trust. *Electronic markets* 12, 3 (2002), 157–162.
- [67] Wixom, B.H. and Watson, H.J. An empirical investigation of the factors affecting data warehousing success. *MIS quarterly*, (2001), 17–41.
- [68] Yeh, J.-C., Hsiao, K.-L., and Yang, W.-N. A study of purchasing behavior in Taiwan's online auction websites: Effects of uncertainty and gender differences. *Internet Research* 22, 1 (2012), 98–115.
- [69] Yen, H.R. Risk-reducing signals for new online retailers: a study of single and multiple signalling effects. *International Journal of Internet Marketing and Advertising* 3, 4 (2006), 299–317.

