

## Does a Mixed Online Consumer Review Lead to Neutral or Ambivalent Evaluation?

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### Abstract

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This paper attempts to uncover how a mixed online consumer review including both positive and negative information is processed and how it influences consumers' attitude, attitude certainty and association between attitude and purchase intention. The findings of this study revealed that the individuals who are exposed to a mixed online consumer review about an unfamiliar brand have a neutral attitude when compared with the individuals who are exposed to consistent online consumer reviews. They, however, form ambivalent attitude toward the reviewed product and are more certain about the formed attitude. The relationships between mixed online consumer reviews and attitude certainty and between mixed online consumer reviews and attitude-purchase intention consistency appear to be moderated by attitude ambivalence.

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**Keywords:** mixed online consumer reviews, attitude ambivalence, inconsistent messages

### 1. Introduction

In recent years, a growing number of consumers shop online and more and more consumers share their purchase experiences online. An online consumer review, which refers to any statement on internet/social media made by potential, actual, or former customers about their experiences, evaluations, and opinions on products and services (Park and Park, 2008), has become one of the most important sources for product information since consumers tend to perceive information retrieved from online consumer reviews as more credible and useful than information created by marketers (Bickart and Schindler, 2002; Bronner and de Hoog, 2010). Studies have examined how online consumer reviews influence consumers' product perception (Hung and Li, 2007), purchase intention (Park, Lee, and Han, 2007), consumer product choice (Gupta and Harris, 2009), and product sales (Duan, Gu, and Whinston, 2008; Zhu and Zhang, 2010). Various aspects of online consumer reviews, such as length of reviews (Mudambi and Schuff, 2010) and perceived quality of reviews (Park et al., 2007), have been explored by academic researchers. Previous research has also examined how the valence of online consumer reviews, that is directions of reviews (i.e., whether they are positive or negative), influences consumers' brand evaluation and purchase behaviors. Studies on the valence of online consumer reviews, however, have revealed inconsistent findings. Some studies have shown that valence has positively influence purchase intention (Tsang and Prendergast, 2009) while other studies have reported that negative online consumer reviews are more diagnostic and persuasive and have a greater impact than positive online consumer reviews on the effectiveness of the reviews (Park and Lee, 2009). Some studies have shown that valence has little explanatory power for sales (Liu, 2006). Studies on the valence of online consumer reviews have explored the factors influence consumers' perception of reviews (e.g. helpfulness and quality) or their product evaluation without considering specific purchase situations. Consumers may process product information that they have exposed to and/or obtained with different levels of motivation (Petty and Cacioppo, 1979). For instance, when consumers begin to search and evaluate product information they tend to use various heuristics to simplify product evaluation.

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They may simply rely on the summary statistics of online consumer reviews, such as numbers of reviews or extreme review ratings (e.g., a strongly negative review) to include/exclude products in/from their consideration without systematically processing the content of online consumer reviews. On the other hand, consumers, who already have a well-developed consideration set, tend to systematically process product information by reading individual reviews. Consumers, who lack purchase experiences, may face greater pre-purchase uncertainties; thus, they are more likely to seek and process additional information to reduce perceived risk and uncertainty (Park and Lee, 2009).

Unlike prior research on the valence of online consumer reviews, this paper focuses on a specific purchase situation where consumers are about to make an important, but unfamiliar product purchases online in order to explore how mixed online consumer reviews, which refer to the reviews contain both positive and negative information, influence consumers' brand evaluation. Previous research on the valence of online consumer reviews has studied the effect of one-sided (positive or negative) reviews on consumer behaviors. However, consumers in the real marketplace are frequently exposed to online consumer reviews containing positive and negative evaluations of products. It is important to understand how consumers process those mixed online consumer reviews. This paper reviews the literature on two-sided marketing messages to understand how mixed online consumer reviews may be processed and develop hypotheses on how consumers perceive and process mixed online consumer reviews and the impact of mixed online consumer reviews on brand attitude and attitude certainty with relevant theories such as accessibility–diagnosticity and ambivalence attitude theory. The paper also explored whether or not an individual difference factor (tolerance of ambiguity) may affect the relationship between mixed online consumer reviews and brand attitude.

## 2. Conceptual Framework and Hypothesis Development

Two-sided messages are one of the heavily researched topics in the persuasion literature. Two-sided messages can be regarded as mixed information in that two-sided marketing messages contain non-favorable claims as well as favorable claims. Two-sided message research might provide insights into how a mixed online review is perceived and related to consumers' product evaluation. Previous research has used attribution theory to explain how two-sided messages are processed and why they are more effective than one-sided messages. Attribution theory assumes that when consumers are exposed to advertisements they try to attribute claims in advertising either to the advertiser's desire to sell a product or to the actual characteristics of a product. The inclusion of less favorable information in advertising leads the receiver of the messages to often conclude that the advertiser is telling the truth (Eisend, 2006). Researchers have hypothesized that the enhanced perception of advertiser credibility will strengthen consumers' beliefs regarding the advertised positive attributes. However, empirical findings are not consistent with these hypotheses. Kamins and Marks (1987) report that attitudes formed on the basis of two-sided messages are more persistent than attitudes based on comparable one-sided messages. But the findings of Pechmann (1992) do not support this relationship. Studies on online consumer reviews also argued that the inclusion of some negative information in online consumer reviews increases the credibility of the reviews; thus, reviews that discuss both the strengths and weaknesses of a product have a stronger impact on consumers' evaluations compared with one-sided positive or negative reviews. However, findings regarding the effect of consumer review valence on consumers' evaluations are not straightforward. For instance, Mudambi and Schuff (2010) found that mixed online reviews were associated with more positive consumer evaluations than positive or negative reviews. Forman, Ghose, and Wiesenfeld (2008) found that extremely positive or negative reviews were associated with higher levels of consumer evaluations than mixed online reviews.

Two-sided message research indicated that mixed online consumer reviews will be perceived as more credible than positive or negative reviews. But it is not clear that mixed online consumer review processes result in more favorable consumer evaluation. As noted in the previous section this paper focuses on a specific purchase situation where consumers are highly motivated to process information received from online consumer reviews to avoid risks related to an important product purchase that they haven't purchased before. On the basis of accessibility–diagnosticity theory and ambivalent attitude theory the paper proposes hypotheses on how consumers process mixed online consumer reviews and how mixed reviews are related to consumers' brand evaluation. Accessibility–diagnosticity theory postulates that the influence of a particular piece of information on the decision process depends on the relative availability of the information in a consumer's memory and the diagnosticity of the information during the decision process (Feldman and Lynch 1988).

When consumers are highly involved in a product purchase, they are motivated to systematically process information related to the purchase (e.g. reading individual consumer reviews); thus, descriptive information in consumer reviews, regardless of review valence, is accessible from consumers' short-term memory. Then consumers evaluate the diagnosticity of individual consumer reviews – whether or not the information provides consumers with relevant product information that helps them in understanding and evaluating the quality and performance of the product (Ahluwalia and Gürhan-Canli, 2000; Jiang and Benbasat, 2007). When consumers are exposed to positive or negative consumer reviews they tend to perceive the positive or negative reviews have a higher diagnostic value in that those reviews provide more straightforward opinions on product purchases. However, contradictory information of mixed online consumer reviews provides consumers with descriptive information about the product without clear evaluative direction; thus, mixed online consumer reviews should be perceived as less diagnostic. Previous research noted that positive or negative reviews have a higher impact on consumer evaluations since such consistent information in the positive or negative balance is perceived as more useful than the relatively inconsistent information in the neutral balance. However, when consumers are highly involved in a product purchase – the research setting of this paper, they would more systematically process less diagnostic mixed online consumer reviews than positive or negative online consumer reviews to reduce purchase uncertainties.

Then how mixed online consumer reviews are associated with consumers' brand evaluation such as brand attitude and attitude certainty? Attitude has been traditionally conceptualized as a unidimensional concept – an evaluative judgment of a stimulus, which represents a person's general feeling of favorableness or unfavorableness toward the target object (Fishbein and Ajzen, 1975). Positive and negative components of an attitudinal evaluation are linked together so that an individual's negative evaluation for a single object increases, the positive evaluation of the same object is assumed to decrease. This implies that an attitude target is not evaluated simultaneously as both positive and negative (Lavine, Thomsen, Zanna, and Borgida, 1998). According to the accessibility–diagnosticity theory, information accessible in memory will be used as an input for judgment. In the context of the present study, as consumers are reading reviews about unfamiliar products they may have little knowledge that congruent or incongruent with the accessed review information. Therefore, this paper expects that positive and negative arguments from reviews recalled by a consumer will strongly affect his/her product evaluation (Holbrook, Krosnick, Visser, Gardner, and Cacioppo, 2001). The traditional unidimensional attitude perspective indicates that consumers who are exposed to mixed online consumer reviews go to the middle point in the bipolar attitude measurement scale because favorable evaluations caused by positive information are neutralized by negative information. Thus,

*H 1: Individuals who are exposed to mixed online consumer reviews about an unfamiliar product will have a neutral attitude when compared with individuals who are faced with consistent (positive or negative) online consumer reviews about an unfamiliar product.*

There is an alternative perspective on the attitude structure that is individuals have two separate evaluation dimensions for positive and negative information rather than one dimension, and these separate evaluation spaces are not linked to each other. Thus, positive and negative evaluative responses toward a single object can occupy separate dimensions, and it is possible for individuals to have both positive and negative evaluations toward the same object (Cacioppo and Berntson, 1994; Priester and Petty, 1996). Coexistence of positive and negative evaluations in the underlying attitude structure refers to attitudinal ambivalence (Kaplan, 1972; Bargh, Chaiken, Govender, and Pratto, 1992). The two-dimensional view of attitudes provides a great deal of insight into the understanding of mixed online consumer reviews. When consumers are highly involved in a product purchase and they do have little purchase experience they may not have pre-existing product knowledge to accept or reject newly obtained information from online consumer reviews. Therefore, it is reasonable to think that when consumers are exposed to a mixture of positive and negative information toward a product, they will have higher attitudinal ambivalence toward the product than when they are exposed to either only positive or only negative information.

*H 2: Individuals who are exposed to mixed online consumer reviews about an unfamiliar product will experience higher attitudinal ambivalence when compared with individuals who are faced with consistent (positive or negative) online consumer reviews.*

Based on several perspectives, this paper expects that mixed online consumer reviews, which induce attitude ambivalence, will positively affect attitude-intention consistency and attitude certainty, which refers to the degree to which an individual is confident that his or her attitude toward an object is correct (Pomerantz, Chaiken and Tordesillas, 1995, p.1132). One reason behind the positive relationship is that a mixed online consumer review is more likely to be processed systematically rather than heuristically (Jonas, Diehl, and Bromer 1997).

According to the heuristic-systematic model, individuals usually try to save cognitive energy while processing information; however, they do not merely tend to save cognitive resources by such heuristic processing but they also desire a certain level of confidence in their own judgment or attitude (Chaiken 1980; Maheswaran and Chaiken 1991). If individuals seek more confidence, they must process information through systematic processing. When customers are faced with mixed online consumer reviews, heuristic processing alone may not be sufficient to reach a certain level of judgmental confidence in the matter of the overall evaluation of the object (Jonas et al., 1997). When consumers are highly involved in an unfamiliar product purchase they tend to carefully process product information regardless of the valence of online consumer reviews. However, mixed online consumer reviews tend to be more systematically processed since mixed online consumer reviews are much less diagnostic than one-sided positive or negative reviews. The attitude accessibility model also provides support to the idea that a mixed online consumer review leads to greater attitude certainty and a stronger link between behavioral intention and the attitude. According to the attitude accessibility model, attitude activation is the first step for attitude to guide behavior (Bargh et al., 1992). Once activated, the attitude influences behavior toward the attitude object. The likelihood that a person's attitude will be activated is primarily determined by the strength of the association in memory between an attitude object and an evaluation (Lavine, Borgida, and Sullivan, 2000). The brand mentioned in a mixed online consumer review and one's attitude will be closely associated in memory because of the more intensive and systemic information process. Thus,

*H 3: Individuals who are exposed to a mixed online consumer review about an unfamiliar product will show higher attitude certainty and a stronger association between attitude and purchase intention when compared with individuals who are faced with consistent (positive or negative) online consumer review.*

How individuals cope with ambiguous information may affect information processing (Schaninger and Sciglimpaglia 1981). Tolerance-of-ambiguity refers to the way an individual perceives and processes unfamiliar and ambiguous information and incongruent cues (Furnham, 1994; Norton 1975). Tolerance-of-ambiguity is related to several cognitive and behavioral dispositions, such as seeking for certainty and avoiding ambiguity, inability to allow for the coexistence of positive and negative features in the same object, and resistance to a rehearsal of ambiguous stimuli (Furnham and Ribhester 1995). Ambivalence and tolerance-of-ambiguity are similar but different concepts. Ambivalence is caused by external stimuli and is context specific while tolerance-of-ambiguity is a person's general and internal traits like personality and is context-free. When individuals with low tolerance-of-ambiguity are exposed to inconsistent information in mixed online consumer reviews, they will experience stress and try to avoid ambiguity and to reach more certain judgment toward the mentioned object. Thus, individuals with low tolerance-of-ambiguity are more likely to be motivated to evaluate inconsistent and ambiguous information than individuals with high tolerance-of-ambiguity (Nowlis, Kahn and Dhar, 2002). Thus,

*H4: Individuals with low tolerance-of-ambiguity will have higher attitude certainty and the stronger association between attitude and purchase intention than individuals with high tolerance-of-ambiguity when they are exposed to a mixed online consumer review about an unfamiliar product.*

### 3. Research Method

In order to collect data and test the proposed hypotheses, this paper employed scenario based online surveys that have successfully used in marketing studies. This study, first, conducted focus group interviews with 20 undergraduates to develop adequate scenarios. To minimize the effect of subjects' prior attitude and purchasing experience and to control levels of involvement, two standards suggested by Sundaram and Webster (1999), which are the product selected for the study should not be previously purchased by respondents and is likely to be purchased in the future, were used to select a product for the study. Through a pretest and sets of interviews, a smart doorbell and four attributes (installation/setup, video (video quality and motion detection), audio (audio quality and two-way communication), and Connectivity) were selected in order to develop scenarios and manipulate the valence of online consumer reviews – positive, negative, and mixed online consumer reviews.

For a main study, 240 undergraduate students attending business classes at a Southern University participated in the survey. The participants were randomly assigned to a manipulated research condition. They were told to think as if they are in the process of buying a smart doorbell and collecting information on several brands by reading consumer reviews. The four attributes of a smart doorbell were mentioned positively or negatively in the provided scenario to manipulate the valence of consumer reviews. For mixed consumer reviews, two of the four attributes had positive levels and two had negative levels ((see Appendix for a mixed online consumer review).

The participants, first, read a brief greeting message from the researchers, instructions for completing the questionnaire, and a consent agreement statement. Then they read a scenario and completed a questionnaire, which consists of overall attitude toward a product, purchase intention, attitude certainty, ambivalence, tolerance-of-ambiguity, and items for manipulation checks. This study used a 7-point likert scale to check manipulations and measure key constructs except attitude ambivalence and tolerance of ambiguity. Spears and Singh (2004)'s scales were adapted to measure attitude toward a product (unappealing/appealing, bad/good, unfavorable/favorable, dislike/like,) and purchase intention (never/definitely, very low/high purchase interest, probably not/probably buy it). Petrocelli, Tormala, and Rucker (2007)'s scale was adapted to measure attitude certainty (how certain are you that the attitude reflects your evaluation?; to what extent is your attitude clear in your mind?; How certain are you that the attitude is really the attitude you have?). The 12-item scale developed by Herman, Stevens, Bird, Mendenhall, and Oddou (2010) was used for the tolerance-of-ambiguity measure. For attitude ambivalence, this study uses the items and procedures proposed by Kaplan (1972). Respondents were asked to rate only the positive or negative aspects of a product on a scale ranging from 0 (not at all), 1 (slightly), 2 (quite), and 3 (extremely). Then the responses were combined into an ambivalence index using the ambivalence formula ( $\text{Attitude Ambivalence} = \text{Attitude}_{\text{positive}} + \text{Attitude}_{\text{negative}} - |\text{Attitude}_{\text{positive}} - \text{Attitude}_{\text{negative}}|$ ). After collecting the data, the researchers examined the data and discarded 12 responses poorly or carelessly filled out. Thus, 228 (male=104, female=124) responses were available for further analysis.

#### 4. Results

*Manipulation checks.* To determine the effectiveness of the valence of consumer review manipulation, subjects were asked to rate the consumer review on a 7 point scale where 1=extremely negative and 7=extremely positive. Subjects in the positive consumer review condition positively rated the messages ( $\bar{x} = 6.117$ ), and subjects in the negative condition negatively rated the messages ( $\bar{x} = 1.971$ ). Subjects in the mixed consumer review condition rated the review neither positively nor negatively ( $\bar{x} = 3.647$ ). Thus, the mean values suggest that the three types of consumer reviews were effectively manipulated. To evaluate the perceived realism of the scenarios, subjects were asked to answer the question 'I believe the situations described in the scenario can actually happen in real life' using a 7 point scale where 1=strongly disagree and 7=strongly agree. A resulting mean score of 6.513 suggested that the subjects considered the scenarios very realistic. Subjects were then asked to respond to the item 'Are you familiar with smart doorbells' using a 7 point scale, and the mean value indicated that subjects were unfamiliar with the product ( $\bar{x} = 1.692$ ).

The validity and reliability of multiple item measures, such as involvement, attitude, attitude certainty, and involvement were checked by exploratory factor analysis and Cronbach's alpha (see Table 1), and then the mean values of these variables were used for manipulation checks and further analysis. Three items of Zaichkowsky (1994)'s involvement scale (unimportant/important, irrelevant/relevant, worthless/valuable) were used to check whether subjects have a similar level of involvement. Most subjects had high involvement ( $\bar{x} = 6.014$ ).

**Table1. Results of Exploratory Factor Analysis and Reliability Test**

	Factor				
	Attitude	Purchase Intention	Attitude Certainty	Involvement	Communality
Attitude4	0.913	0.324	0.114	-0.020	0.953
Attitude1	0.909	0.272	0.071	-0.027	0.905
Attitude3	0.879	0.356	-0.013	-0.011	0.900
Attitude2	0.871	0.310	0.088	-0.046	0.864
Purchase Intention2	0.438	0.888	0.059	0.021	0.984
Purchase Intention1	0.448	0.869	0.058	0.017	0.960
Purchase Intention3	0.420	0.867	0.073	0.006	0.934
Attitude Certainty3	0.058	0.007	0.996	-0.065	0.999
Attitude Certainty1	0.091	0.128	0.724	-0.131	0.565
Attitude Certainty2	0.021	-0.002	0.711	-0.027	0.507
Involvement1	-0.056	-0.017	-0.016	0.897	0.809
Involvement2	0.001	-0.029	-0.093	0.807	0.660
Involvement3	-0.009	0.062	-0.096	0.723	0.537
Eigenvalues	2.213	5.264	1.169	1.931	
% of variance	17.02	40.489	8.993	14.856	
Cronbach's Alpha	0.973	0.986	0.841	0.851	

Maximum likelihood extraction method with varimax rotation.

Next, ANOVA was used to see whether respondents in the conditions (positive, negative and mixed consumer reviews) are different in product familiarity, involvement, and perceived realism of the scenarios. The results of analyses showed that there is no significant difference among three groups (see Table 2).

**Table2.Summary of Manipulation Checks**

Dependent Variable	Independent Variable	Means	Standard Deviations	# of Sample	F-value (p-value)
Product Familiarity	P-COR	1.750	0.677	68	1.101 (0.334)
	N-COR	1.735	0.589	68	
	M-COR	1.620	0.590	92	
Involvement	P-COR	6.025	0.583	68	0.198 (0.821)
	N-COR	6.044	0.609	68	
	M-COR	5.986	0.613	92	
Scenario realism	P-COR	6.544	0.584	68	1.119 (0.329)
	N-COR	6.588	0.851	68	
	M-COR	6.435	0.580	92	

*Hypothesis Testing.* The mean values of attitude in three conditions were compared to assess Hypothesis 1. The three mean values were significantly different ( $F=198.671$ ,  $p=0.000$ ), and as expected examination of the means indicated that subjects in the mixed consumer review condition had a neutral attitude ( $\bar{x}=4.196$ ) when compared with subjects in the positive condition ( $\bar{x}=5.934$ ) and with those in the negative condition ( $\bar{x}=2.816$ ). Thus, Hypothesis 1 was supported (see Table 3 for details). Subjects in the three conditions had significantly different levels of

ambivalence ( $F=43.762$ ,  $p=0.000$ ). Further, examination of the means revealed that the subjects in the mixed consumer review condition had a higher level of ambivalence than those in positive or negative conditions, who had a similar level of ambivalence, which supports Hypothesis 2 (see Table 3 for details).

**Table3.Summary of ANOVA Results**

Dependent Variable	Independent Variable	Means	Standard Deviations	# of Sample	F-value (p-value)
Attitude <sup>a</sup>	P-COR	5.934	0.717	68	198.671
	N-COR	2.816	1.027	68	(0.000)
	M-COR	4.196	0.955	92	
Ambivalence <sup>b</sup>	P-COR	1.294	1.185	68	43.762
	N-COR	1.882	1.086	68	(0.000)
	M-COR	3.043	1.309	92	
Attitude Certainty <sup>c</sup>	P-COR	3.554	0.614	68	41.124
	N-COR	3.049	0.708	68	(0.000)
	M-COR	4.250	1.048	92	

- a. The significant mean difference: Positive-Negative ( $p=0.000$ ), Mixed-Positive ( $p=0.000$ ), Mixed-Negative ( $p=0.001$ )
- b. The significant mean difference: Positive-Negative ( $p=0.014$ ), Mixed -Positive ( $p=0.000$ ), Mixed -Negative ( $p=0.000$ )
- c. The significant mean difference: Positive-Negative ( $p=0.002$ ), Mixed-Positive ( $p=0.000$ ), Mixed -Negative ( $p=0.000$ )

Subjects in the three conditions were also different in terms of attitude certainty ( $F=41.124$ ,  $p=0.000$ ). The mean difference analysis indicated that subjects in the positive or negative consumer review condition had lower levels of attitude certainty than those in the mixed consumer review condition. Subjects in the mixed consumer review condition also showed stronger association between attitude and purchase intention ( $r=0.376$ ,  $p=0.000$ ) than those in the positive condition ( $r=0.309$ ,  $p=0.010$ ) or those in the negative condition ( $r=0.294$ ,  $p=0.015$ ). Thus, Hypothesis 3 was supported.

The researchers also tested whether attitude ambivalence moderates the effect of mixed consumer reviews on attitude certainty and the association between attitude and behavior intention. The mean value of ambivalence ( $\bar{x}=2.024$ ) was used to divide the subjects in the mixed consumer review condition into two groups (low vs. high attitude ambivalence). The attitude certainty scores were different between the high and low attitude ambivalence groups ( $t= 6.386$ ,  $p=0.000$ ). The subjects with high attitude ambivalence ( $\bar{x}=4.750$ ) were more certain about their attitude than the subjects with low attitude ambivalence ( $\bar{x}=3.472$ ) and showed stronger association between attitude and behavior intention( $r=0.592$ ,  $p=0.000$  for high attitude ambivalent subjects,  $r=0.370$ ,  $p=0.024$  for low attitude ambivalent subjects).

**Table4.Summary of t-test Results**

Dependent variable	Independent variable (# of sample)	Mean	Standard Deviation	t-value (p-value)
Attitude Certainty	Low ambivalence (37)	3.459	0.961	-7.134 (0.000)
	High ambivalence (55)	4.782	0.721	
Attitude Certainty	Low Tolerance of ambiguity (49)	4.503	0.845	2.496 (0.015)
	High Tolerance of ambiguity (43)	3.961	1.185	

Hypothesis 4 addressed whether tolerance-of-ambiguity moderates the effect of the mixed consumer reviews on attitude certainty and the association between attitude and intention. Subjects exposed to the mixed consumer review condition were divided into high and low tolerance-of-ambiguity groups at the mean value of tolerance-of-ambiguity ( $\bar{x}=4.296$ ), and then attitude certainty scores in the two groups were compared. Attitude certainty was

significantly different between high and low tolerance-of-ambiguity groups ( $t=2.496$ ,  $p=0.015$ ). However, subjects with high tolerance-of-ambiguity showed a stronger association between attitude and behavioral intention ( $r=0.377$  ( $p=0.008$ ) for low tolerance individuals;  $r=0.388$  ( $p=0.010$ ) for high tolerance individuals). Thus, Hypothesis 4 was partially supported.

## 5. Discussion

It has been noted that consumer reviews are positively related to consumers' attitude toward the reviewed product, and the findings of this study reaffirm this argument because attitudes of the subjects in the positive consumer review condition were more favorable than attitudes of those in the negative consumer review condition.

Past studies have also argued that inconsistent information will stimulate additional cognitive processing; therefore, inconsistent messages containing both positive and negative information would lead to more favorable attitude. Unlike past studies on inconsistent messages, this paper hypothesized that individuals who are exposed to mixed consumer reviews would have a more neutral attitude rather than positive attitude because the positive evaluations would be counterbalanced by negative evaluations.

This is exactly what this paper found.

Even though the additional cognitive processing caused by inconsistency in mixed consumer reviews did not lead to more favorable attitudes, the results of this study show that it does affect other aspects of attitude. Positive and negative messages in mixed consumer reviews occupy separate evaluation dimensions and do cause individuals to have both positive and negative evaluations and feelings – attitude ambivalence. It is not easy for individuals to combine incongruent messages and to judge the product mentioned in mixed consumer reviews, especially when they do have little previous purchase experience. So positive and negative messages in mixed consumer reviews are more likely to be systematically processed, and as a result of this intensive process a neutral attitude is chosen. Thus, individuals exposed to mixed consumer reviews are more likely to be confident about their attitude, and the formed attitude tends to be closely related to their behavior intentions. If only the traditional bipolar attitude scale is used to look at the effect of mixed consumer reviews on attitude toward a product, important characteristics of attitude will be disregarded. Measurements for strength of attitude, such as attitude ambivalence, as well as a traditional attitude measurement should be used to catch important additional information about consumers' attitude.

It might be said that individuals will automatically assign more cognitive energy to process inconsistent messages. However, the findings of this study demonstrated that even if individuals are exposed to the identical mixed consumer reviews, they might have different levels of attitude ambivalence. Individuals with high ambivalent evaluations tend to pay more attention to and be more motivated to process inconsistent messages while individuals with low ambivalence will not do so. As a result, individuals with high ambivalence have higher levels of attitude certainty and consistency of attitude and purchase intention. Individuals' cognitive personality traits (tolerance-of-ambiguity) may influence how inconsistent messages are processed. Individuals are different in terms of how they cope with inconsistent information because they have different levels of allowance for the coexistence of positive and negative information in an object; thus, the amount of cognitive energy that an individual puts into processing mixed consumer reviews will be different. It was expected that the effect of mixed consumer reviews on attitude certainty and the consistency between attitude and intention would be moderated by tolerance-of-ambiguity; however, the results of analysis didn't fully support this hypothesis. This might be attributable to the characteristics of tolerance-of-ambiguity. Tolerance-of-ambiguity is a personality variable and may not reflect exactly how much the individuals felt ambiguity in this specific situation.

Limitations and future research. This study controlled several variables (e.g. brand familiarity and levels of review valence) related to the processing of mixed consumer reviews to explore how individuals perceive and process mixed online consumer reviews. For example, Sundaram and Webster (1999) noted that brand familiarity enhances the brand attitude and moderates the relationship between consumer-generated messages and brand purchase intention. Thus, future research might examine how the valence of consumer reviews (positive, negative, and mixed) and product familiarity (high and low) influence consumers' product evaluations and the strength of attitude. This study considers only equal amounts of positive and negative information for mixed consumer reviews. There are, however, many possible combinations of positive and negative information. Thus, it is meaningful to study how levels of consumer review valence influence consumers' information process and brand evaluation.

In this study, the scenario provided information for only one brand to subjects, and the degree to which subjects elaborate and process the messages was not directly measured. In reality, a consumer is likely to be exposed to multiple brands during a typical information search and may receive positive consumer reviews about one brand and

negative consumer reviews for another brand. This can affect how consumers evaluate brands in their choice set. Therefore, it is more realistic for future research to consider consumer reviews for more than one brand and employ measures of the cognitive elaborating process to confirm whether it is the inconsistent information that is truly causing the effects obtained.

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## Appendix. Mixed Online Consumer Review

I've owned the smart doorbell for about 6 months. Here are my honest reviews on the smart doorbell.

**Installation and setup.** Installation is really simple and straightforward (anyone that can use a screwdriver can do this). Assuming you have a wooden frame around your door, you can have the doorbell screwed on in about a minute.

There's a small lock screw at the bottom of the doorbell to secure it to the mount that will prevent anyone from pulling it off. Setting up the doorbell is a quick task. As soon as it's powered up, it enters connection mode and from then it takes just a couple of taps in the doorbell app to add it to the system.

**Video features (video quality and motion detection).** The video quality of the smart doorbell is great (1080p resolution) The motion triggered alerts work just like they do with the smart doorbells. I set the smart doorbell to start recording video and to be notified by phone with a motion alert. This works well, even in Silent Mode. If you want, you can setup things up such that when motion is detected that the Base Station alarm is triggered. You can also trigger an external alarm.

**Audio features (Sound quality, two-way communication).** The sound quality on the smart doorbell is not great. Don't expect what is shown in the marketing videos to reflect the reality of the product. But wait, it gets worse. The sound quality is terrible and I would frequently get an annoying beeping and feedback echo at the doorbell. If you do not answer the alert fast enough, you are locked out-- even though someone is standing at your front door. If someone is there and you do not have an "ACCEPT" button on the screen, there is just no way to see or talk to them. This is obviously a software flaw.

**Connectivity.** The smart doorbell software is incredibly slow, buggy, and crashes frequently. I wasn't able to "turn on" the camera from my phone a few times. The smart doorbell does not play well with two or more devices. If you have one smart doorbell app opened somewhere and you then try to open it on another device (such as my phone when I'm out of the house)--crash. How is this possible? And good luck trying to use the "Live View" feature. It takes at least 30 seconds to connect to the doorbell and again, crashes the app the majority of the time. The frustration level is just off the charts and I cannot believe the app ever made it out of beta.