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2006

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Abstract

An online consumer review is the information including experiences, evaluations and opinions on products from the consumer perspective. An online consumer review plays two roles - informant and recommender. Considering two factors of review structure (the number of reviews and review type), this study analyzes the effect of online consumer reviews on consumers' information processing depending on their levels of involvement. Generally, more positive reviews seem better from the perspective of online consumer reviews as recommenders. However, from the perspective of online consumer reviews as information providers, consumers may be confronted with too much information when a large number of reviews are offered, which results in information overload. We investigate when information overload occurs in the context of online consumer reviews, what strategies against the information overload consumers use depending on their levels of involvement, and how the product attitude and purchasing intention are changed. Our findings have implications for online sellers in terms of how to manage online consumer reviews contents.

Keywords: information overload, online consumer review, elaboration likelihood model, electronic word of mouth

1. Introduction

Since the development of the World Wide Web (WWW) on the Internet in the early 1990's, the increasing number of companies has been trying to carry out electronic commerce (EC). As a new marketing channel, the Internet differs from the traditional retail channels in many ways (Alba et al. 1997). Online consumers cannot touch or smell the products, so they have to base their judgment on the product information presented on the websites. Thus, it is necessary for online sellers to give consumers the opportunity to share their product evaluations online (Avery et al. 1999). This consumer-created information, an online consumer review, is helpful for decision-making on purchases since it provides consumers with indirect experiences.

An online consumer review is new information including experiences, evaluations and opinions on products from the consumer perspective. An online consumer review plays two roles - informant and recommender (Park et al. 2005). An online consumer review provides both user-oriented product information by an informant and recommendations by previous consumers in the form of electronic word-of-mouth (eWOM). There is recent evidence that consumer reviews have become important for product sales in real business (Chen and Xie 2004).

The number of online consumer reviews is related to sales volume of a product since online sellers allow consumers to post reviews after purchase. It is easily obeserved that

some products have too many reviews to completely read in real online shopping malls. From the perspective of online consumer reviews as recommenders, more reviews are better. However, from the perspective of online consumer reviews as information providers, consumers are confronted with too much information from the reviews, which results in information overload.

Information overload occurs when the volume of information supply exceeds the capacity of an individual. The results are dysfunctional consequences (such as stress or anxiety). In the information overload literature, not only the amount of information and the available processing time (i.e., the quantitative dimension), but also the characteristics of information (i.e., the qualitative dimension) are seen as major overload elements (Schick et al. 1990, Keller and Staelin 1987, Schneider 1987). In the context of online consumer reviews, consumers may not feel overloaded simply because they encounter a large number of reviews. The contents of reviews are various from simple recommendation to attribute-value information, so they require the different level of cognitive resources depending on contents. Therefore, the qualitative dimension of reviews should be considered as a major overload element.

According to the elaboration likelihood model, individuals who are highly involved with an issue or product category engage in item-specific processing of the persuasive messages. Individuals who are less involved are not affected by the argument contents, but rather by non-content elements (peripheral cues) (Petty et al. 1981). As consumers with different levels of involvement use different processing, the processing strategy against information overload may have to be different depending on the level of involvement. It is important to find out what strategies consumers use when they experience information overload to develop the adequate review formats for consumers with different levels of involvement. These findings may help to improve the use of online consumer reviews.

In this study, we suggest several hypotheses and conduct an experiment to address these issues focusing on positive online consumer reviews as positive eWOM. We investigate when information overload occurs in the context of online consumer reviews, and how product attitude and purchasing intention are changed.

2. Theoretical Background

2.1 Online Consumer Reviews

Consumers acquired product information from mainly two channels: from the overall mass media system and the retail network through advertisements and from word-of-mouth (WOM). There is little debate as to whether WOM matters to the firm (Katz and Lazarsfeld, 1955). Recently, the Internet is used as a new channel for WOM communication, which is called eWOM. Half of consumers who visited online shopping malls consider online personal recommendations to be important or extremely important in their buying decisions (Los Angeles Times 1999).

Our study focuses on online consumer reviews (OCR). OCR is information which prior buyers created about their experiences, evaluations and opinions on products in online shopping malls. OCR provides two types of information: attribute-value information and recommendations that consumers request for purchasing a product (Rosen and Olshavsky 1987). OCR plays an important role in decision processes in which the decision maker

obtains recommendations of previous consumers and user-oriented information for the purpose of reducing the uncertainty and learning a product (Bickart and Schindler 2001). OCR can be a decision variable for a seller. Online sellers can decide whether to provide online consumer reviews on their website (Chen and Xie 2004). In addition, the online seller can choose a "remarkable review" and provide it in front of its website. That leads consumers to concentrate on the review.

Each OCR is different from others because there is no standard format for a consumer to post a review. Some reviews such as "It is so good that I'll buy another one" or "I can't believe I got this. I'm proud of this" are subjective, emotional and have no support for arguments. These kinds of reviews are simple recommendation reviews. On the contrary, some reviews provide attribute-value information such as "It has lots of functions and good interface. I'll recommend it to my friends" or "This product is twice as fast as other comparable goods and even cheaper," which are specific, clear and having reasons for arguments.

2.2 The Elaboration Likelihood Model for OCR Processing

The changes of consumers' product attitude and purchasing intention according to the number of reviews and the type of reviews are explained by the elaboration likelihood model (ELM) developed by Petty and Cacioppo (1986). The ELM posits individuals who have the motivation and the ability to process a message are more likely to process persuasion attempts via the central route. In other words, they are more likely to engage in thoughtful and effortful processing of persuasive arguments and attend to the persuasive arguments, and then generate their own thoughts in relation to the arguments. However, individuals lacking motivation or ability are more likely to process the information via the peripheral routes, which are mental shortcuts, by focusing on non-content cues. ELM researchers have found that, under high-involvement conditions, issue-relevant arguments and product-relevant attributes were more influential, while peripheral cues were more influential under low involvement conditions (Petty et al. 1983).

When consumers are involved in low involvement process of online consumer reviews, they engage in peripheral processing by focusing on non-content cues such as the number of reviews. They do not consider the review content. On the other hands, consumers in high involvement are more likely to process persuasion attempts via the central route so that review content is important for them. Since attribute-value reviews are more persuasive than simple recommendations, these consumers are affected by the increase of attribute-value reviews more favorably than that of simple recommendations (Park et al. 2005).

2.3 Information overload in the context of online consumer reviews

Usually, an online consumer review is created after a product is sold (that is the policy of online shopping mall). As a result, the increase of product selling means the increase in online consumer reviews. At present, there is no computer tool to limit online consumer review quantity. Although many consumer reviews can be a signal of product popularity, they can produce undesirable results and dysfunctional consequences for potential consumers because of information overload. Information overload is the phenomenon of too much information overloading a consumer, causing adverse judgmental decision

making. Consumers are often faced with large amounts of information; their limited processing capacity can become cognitively overloaded if they attempt to process "too much" information, and this can result in confusion, cognitive strain, and other dysfunctional consequences (Malhotra 1984, Keller and Staellin 1987, Jacoby et al. 1974). Consumers also become less satisfied, less confident, and more confused in their choice when provided with much information (Scammon 1977, Malhotra 1982, Keller and Staelin 1987).

Traditional approaches for measuring the amount of information provided to consumers (Bettman et al. 1990, Jacoby et al. 1974, Keller and Staelin 1987, Malhotra 1982) involve simple counts of the number of alternatives and attributes in a choice set. However, Lurie (2004) argues that the likelihood of information overload depends on multiple structural factors of information such as information formats or types. Information structure has important implications for information acquisition, the amount of information processing, and decision quality.

In this study, two dimensions of review structure are considered to predict information overload: the number of reviews and the type of review content. In the context of online consumer reviews, information quantity may not be measured simply by counting reviews. Information overloading may be viewed from a qualitative point of view because there are various types of reviews from simple recommendation to attribute-value information. Each type of review needs a different level of cognitive resources. Simple recommendation reviews provide emotional and subjective opinions with the consequence that they can be understood easily at a glance. On the other hand, it is not easy to catch the meaning of attribute-value reviews. It takes a longer time and requires more cognitive resources to process them. Information overload may occur not when consumers read a large number of reviews but when consumers read a large number of attribute-value reviews.

Hypothesis 1. Information overload occurs when a large number of attribute-value reviews are offered.

- *1-1. Consumers perceive (a) more information overload and feel (b) less confident, (c) less satisfied, and (d) more confused when a large number of attribute-value reviews are offered than when a moderate number of attribute-value reviews are offered.*
- *1-2. Consumers perceive (a) more information overload and feel (b) less confident, (c) less satisfied, and (d) more confused when a large number of attribute-value reviews are offered than when a large number of simple recommendation reviews are offered.*

There are two main strategies when consumers confront much information: the selective reading strategy and the skimming/scanning reading strategy (Hopkins 1995). In the context of online consumer reviews, the selective strategy means that consumers choose some reviews because of their own rules and only process them (Badwen et al. 1999). Performing this strategy, consumers can decide which reviews to choose from the title, but there is a risk of missing many things. Skimming/scanning entails a very fast reading of headings, subheadings, topic sentences, and small sections of text to get the gist of the document. Reading theorists have identified skimming and scanning together as the way that people process online text (Sticht 1977). Using this strategy, consumers can catch the

general idea of information, but they miss detailed information. To focus on concepts and principles rather than details was also one solution to deal with information overload. One cost of this rapid scanning is distraction and the information user may have the feeling of being disconnected or disengaged from the information (Klapp 1986).
When information overload is experienced by consumers, the level of consumer involvement may lead to a different strategy. High involvement conditions are likely to stimulate more intensive information acquisition and processing, which could cause consumers to overload themselves unintentionally (Keller and Staelin 1987) whereas low involvement conditions require less information processing.
Under high involvement conditions, consumers usually have a tendency to process all available information. As a result, a large number of reviews impose a heavy burden on highly involved consumers, so they may use the skimming/scanning strategy to catch the general idea of the information set. During this information processing, they are concerned about the detailed information that they miss, which increases their uncertainty, and decreases their self-confidence. In addition, they may blame online sellers for this confusion from information overload caused by the lack of managing reviews. Finally, these result in unfavorable consequences such as the decrease of consumer product attitude and purchasing intention (Turnbull et al. 2000, Foxman et al. 1990, Mitchell and Papavassiliou 1999, Walsh 1999). Therefore, we suggest the following hypothesis
Hypothesis 2. The (a) product attitude and (b) purchasing intention of high-involvement consumers initially increase, then decrease, gradually, with the number of attribute-value reviews, drawing an inverted U shape.

On the contrary, low involvement consumers do not have the motivation to read all reviews, so they use a selective strategy. They choose some reviews according to their own rules such as focusing on negative reviews or randomly selecting and reading three reviews. The other reviews that they do not choose to read will `bypass' the decision-maker to decrease the likelihood of overload confusion. They just take mental shortcuts by focusing on peripheral cues such as the number of reviews. Thus, they have more favorable product attitude and purchasing intention when a large number of attribute-value reviews are offered than when a moderate number of attribute-value reviews are offered even though information overloading occurs. Therefore, we suggest the following hypothesis
Hypothesis 3. The (a) product attitude and (b) purchasing intention of low-involvement consumers improve with the number of attribute-value reviews.

Simple recommendation reviews don't bring out information overload because they do not require many cognitive resources. As a result, it is predicted that the qualitative effects of the ELM still exist. That is, the attitude of low-involvement consumers is influenced by the number of simple recommendation reviews while the attitude of high-involvement consumers does not change because the simple recommendation reviews provide weak arguments. Therefore, we suggest the following hypotheses.
Hypothesis 4. The (a) product attitude and (b) purchasing intention of high-involvement consumers do not change with the number of simple recommendation reviews.

Hypothesis 5. The (a) product attitude and (b) purchasing intention of low-involvement consumers improve with the number of simple recommendation reviews.

3. Research Design and Method

3.1 Design, Subjects, and Experimental System

We employed a 2×3×2 factorial design. The three independent variables are review type (simple recommendation and attribute-value information), the number of reviews (small, moderate, and large), and involvement (low and high). Three hundred thirty four college students participated in this experiment. Their average age was 23.6 years. Random assignment to each of the cells was performed. Most of them already had purchase experiences in online shopping malls.

The PMP (Portable Multimedia Player) was chosen as the experiment product. PMP is a portable next generation multimedia player that plays digital music and video files. There are three reasons for choosing this as the experiment product. First, electronic products are frequently purchased in online shopping malls. Second, consumers tend to rely on the comments from previous users due to the fact that electronic products are complicated. Third, PMP is a brand-new product for general consumers, so consumers processed the suggested information with no stereotypes about the brand and its brand category.

A virtual shopping mall site was provided for each subject. The mall contained information on the target product including seller-created information and consumer reviews. There was the picture of the product, but brand names of the product were hidden to remove the brand effect. Seller-created information consisted of the product overview and its functions. Each function was explained briefly. All of them were replicated from a real Internet shopping mall.

3.2 Independent Variables

Online Consumer Reviews We created 40 reviews based on real reviews from online shopping malls. Each online consumer review included a title, a poster name and contents. We controlled the length of reviews because it can affect information quantity (Chevalier and Mayzlin 2003). The length of each review was set at 3 lines with a font size of 10 to eliminate the effect of the length on review characteristics.

A focus group interview (18 subjects who did not participate in the main experiment) was used to decide the level of review quantity. When surfing Internet shopping malls, these members reported that they generally read 5-6 reviews with 3-4 lines. Along these interview results, 1 was selected as small, 6 was selected as moderate, and 12 was selected as large.

The attribute-value reviews contained product-relevant attribute/benefit information. On the other hand, the simple recommendation reviews consisted of emotional, subjective recommendations without any support. We classified the 40 reviews into either attribute-value information or simple recommendation. Before the main experiment, a pretest was conducted to check whether these reviews were perceived as we intended. We asked another 20 subjects (who did not participate in the main experiment) to classify each review according to the review types. The reviews that all subjects selected unanimously as either attribute-value information or simple recommendations were used for the main experiment.

Involvement Involvement has been conceptualized as being of two types – enduring and situational (Celci and Olson 1988). Enduring product involvement is considered to be a stable phenomenon as it represents the consumer's personal interest in the product over a long period of time. Meanwhile, situational involvement is defined as the ability of a situation to elicit from individuals concern for their behavior in that situation. It is a temporary elevation of interest that fluctuates, usually within the time frame of a purchase decision. Although the motivation to process product information is influenced by situational involvement and enduring involvement, the situational involvement is used in this study because the situational involvement is more likely to result from a goal-directed behavior, thus it can be easily manipulated not like enduring involvement (Celci and Olson 1988). The involvement manipulation was embedded in the introductory page, and role playing was used to create the manipulation (Maheswaran and Sternthal 1990, Meyers-Levy and Peracchio 1995). Involvement was dichotomized into high and low levels. The two involvement situations differ in the amount of goal directedness. The high-involvement respondents were asked to imagine a scenario where they should buy a PMP product for their business since they worked in the multimedia industry. These instructions created a high level of goal directedness, with respondents focusing their attention on PMP-related issues (Maheswaran and Sternthal 1990). As opposed to the high-involvement situation, the role-playing instructions for the low-involvement situation completely lacked goal directedness. Low-involvement subjects were simply asked to imagine that they were browsing a website for fun. Through this manipulation, the high-involvement subjects read and processed the product information more carefully, but the low-involvement subjects did not.

3.3 Dependent Variables

The Information Overload To find out the occurrence of information overload, two variables are measured. One is the perceived information overload (Franz, 1999, Kock 2000): Do you feel that you suffer from information overload? *(1 = strongly disagree, 6 = strongly agree).* The other is the subjective state. Subjects responded to the following 6-point likert-type items that were designed to tap into the impact of information load on their subjective states (Jacoby et al. 1974, Malhotra 1982, Scammon 1977): How satisfied are you with your decision? (1 = *very dissatisfied*; 6 = *very satisfied*). How confident are you in your choice? (1 = *not confident at all*; 6 = *very confident*). How confused did you feel while performing this task? (1 = *not confused at all*; 6 = *very confused*).

Product Attitude and Purchasing Intention The measurements of product attitude are from the study of Sternthanl et al. (1994). These refer to a person's overall evaluation of persons, objects, and issues. These are measured by six-point numeric scales with 1 representing extremely unlikely and 6 extremely likely such as favorable vs. unfavorable, positively evaluative vs. negatively evaluative, high quality vs. low quality and useful vs. useless. Purchasing intention was measured on two six-point numeric scales. The scale items were taken from previous studies published in the information technology and marketing literature. The corresponding questions were: 'How likely is it that you will buy this product?' and 'How likely is it that you will recommend this product to your friends?' (Cronin and Taylor 1994, Lang 2000)

3.4 Control Variables

An online shopping experiment could be affected by the characteristics of the subjects and stimulus. Random assignments were used to control the effects of possible confounding variables and improve the internal validity of this study. The individual differences including personality, cognitive style and personal web experiences, were controlled by randomly assigning the subjects to the experimental conditions (Hong et al. 2004). The individual differences of general attitude for reviews are measured (Park et al. 2005).

All groups should equally accept seller-created information (product advertisement). In addition, the degree of review positiveness for the product should be controlled because this study considers only positive reviews. Four measurements for the product advertisement and two measurements for review positiveness are used (Park et al. 2005). Other variables to change the effects of online consumer reviews should be controlled. The experiment product was brand-new, so product familiarity was controlled in the experiment. Also, the brand effect was no problem since we hid the brand name and information about the brand. Prior knowledge was investigated in the survey by an item with anchors ranging from "I've never heard of it" to "I know it well." Prior knowledge is used as a covariate variable for hypotheses testing.

3.5 Experimental Procedure

At the start of the experiment, the subjects were told that all the instructions were provided in the survey and that they should read the instructions carefully and complete the experiment independently. First, the subjects were manipulated to imagine different scenario in terms of involvement. Product information - seller-created information and online consumer reviews - was provided. The quantity and type of online consumer reviews were provided differently depending on each group's conditions. After that, the subjects were asked to fill in the same questionnaire including purchasing intention, manipulation checks, recall checks and demographic information.

4. Research Results

4.1 Manipulation and Control Checks

The subjects' responses on the two items designed to check their perception of the quantity of reviews were averaged. An ANOVA analysis indicated the presence of the main effect of review quantity ($F(2,331) = 446.522$, $p < .01$, mean = 4.49, 3.29 and 1.67). The subjects' responses on the manipulation checks relevant to the type of reviews were also examined. Six items obtained by referring to studies on information quality were factor analyzed. A single factor was generated with an Eigenvalue of 4.44 and Cronbach's alpha of 0.96. The ANOVA test showed that subjects involved in the attribute-value-review condition indicated greater perception of the quality of reviews than those involved in the simple-recommendation-review condition ($F(1,332) = 50.703$, $p < .01$, mean =3.82 and 3.05). Finally, the involvement manipulation was checked by using recall scores (Shavitt et al. 1994). Subjects were asked to check the attributes of the experiment product among 8 attributes. Subjects in the high-involvement condition had more correct answers than those in the low-involvement condition ($F(1,332) = 280.687$, $p < .01$, mean = 7.01 and 5.18).

There is no significant difference of general attitude for reviews among groups ($F(11,322) = 1.506$, ns). All groups equally accepted seller-created information

(F(11,322) = 0.228, ns). The degree of positiveness of reviews on the product was also controlled successfully (F(11,322) = 0.824, ns). Prior product knowledge was significantly different among groups, so it was used as a covariate variable for hypotheses testing (F(11,322) = 3.396, p < .01).

4.2 Hypotheses Testing

To test Hypothesis 1, a multivariate analysis of variance is performed on the perceived information overload and the three subjective state measurements. Review type and the number of reviews are used as independent variables. Results show the significant main effects of review quantity (Wilks's lambda = 0.287, p < .01) and review type (Wilks's lambda = 0.356, p < .01) as well as the significant interaction effect of the number of reviews × review type (Wilks's lambda = 0.416, p < .01). As a next step, four separate analyses of variance are performed, with the perceived information overload and each subjective state measurements serving as the dependent variable. These results are shown in Table 1. First of all, subjects viewing the large number of reviews perceive more information overload and feel less confident, less satisfied, and more confused in their decisions than those viewing a moderate number of reviews. Second, subjects involved in the attribute-value reviews perceive more information overload and feel less confident, less satisfied, and more confused in their decisions than those involved in the simple recommendation reviews. Finally, each interaction effect is significant. Therefore, subjects involved in the large number of attribute-value reviews have stronger perceived information overload and felt more confused, less confident and less satisfied in their decisions than participants involved under any other conditions. These relationships are shown in Table 2. Hypothesis 1 is supported.

Independent Variables	MANOVA		Dependent Variables							
			Perceived Info. Overload		Confusion		Confidence		Satisfaction	
	Wilks' Lambda	Sig.	F	Sig.	F	Sig.	F	Sig.	F	Sig.
the number of reviews	0.29	0.01	247.20	0.01	309.81	0.01	55.17	0.01	38.80	0.01
review type	0.36	0.01	154.27	0.01	203.04	0.01	57.18	0.01	63.16	0.01
the number of reviews * review type	0.42	0.01	113.41	0.01	135.22	0.01	47.82	0.01	74.57	0.01

Table 1. MANOVA and Univariate ANOVAs of Information Overload Variables

conditions	Dependent Variables			
	Perceived Information Overload	Confusion	Confidence	Satisfaction
Mean Difference (a)	2.393 (p<0.01)	2.589 (p<0.01)	-1.982 (p<0.01)	-1.929 (p<0.01)
Mean Difference (b)	2.093 (p<0.01)	2.292 (p<0.01)	-2.001 (p<0.01)	-2.151 (p<0.01)

Note: Mean Difference (a) = a large number of attribute-value reviews — a moderate number of

attribute-value reviews
Mean Difference (b) = a large number of attribute-value reviews — a moderate number of simple recommendation reviews

Table 2. Mean Difference of Information Overload Variables

The six items for measuring product attitude and purchasing intention are factor analyzed. The factor analysis reveals that one factor (product attitude) is generated with an Eigenvalue of 3.263 and Cronbach's alpha of 0.86, and the other factor (purchasing intention) is generated with an Eigenvalue of 1.080 and Cronbach's alpha of 0.69. A multivariate analysis of variance is performed on product attitude and purchasing intention. As the next step, two separate analyses of variance are performed, with product attitude and purchasing intention serving as the dependent variable. These results are shown in Table 3.

Independent Variables	MANOVA		Dependent Variables			
			Product Attitude		Purchasing Intention	
	Wilks' Lambda	Sig.	F	Sig.	F	Sig.
the number of reviews	0.682	0.01	19.706	0.01	66.142	0.01
review type	0.995	0.43	0.189	0.67	1.658	0.20
involvement	1.000	0.97	0.048	0.83	0.038	0.85
the number of reviews * review type	0.884	0.01	11.991	0.01	12.632	0.01
the number of reviews * involvement	0.963	0.02	4.697	0.01	2.627	0.08
review type * involvement	0.885	0.01	23.228	0.01	26.260	0.01
the number of reviews * review type * involvement	0.922	0.01	5.659	0.01	10.271	0.01

Table 3. MANOVA and Univariate ANOVAs of Product Attitude and Purchasing Intention

Since the three way interaction of review quantity × review quality × involvement is significant ($F(1,337) = 6.406$, $p < .01$) in both dependent variables, we can separate and analyze these results in terms of involvement. The estimated means are presented in the Figure 1 and 2. To test hypotheses 2, 3, 4 and 5, each mean is compared with one another. For high involvement consumers, the product attitude and purchasing intention have an inverted U shape with the number of reviews when the attribute-value reviews are offered. The product attitude do not change with the number of reviews when the simple recommendation reviews are offered. But the purchasing intention is higher with a moderate number of reviews than with a small number of reviews. Therefore, hypothesis 2 is accepted while hypothesis 4 is partially accepted. For low involvement consumers, the product attitude and purchasing intention increase with the number of reviews only when the simple recommendation reviews are offered. For the attribute-value reviews, the product attitude and purchasing intention have inverted U-shape under low-involvement condition like the high involvement condition. This result may explain with the coping strategy of low-involvement consumers. They are more likely to use the

selective strategy with the number of reviews, so the portion of read reviews decreases. This may generate more uncertainty for the unselected reviews, affecting the product attitude and purchasing intention of low-involvement consumers. Finally, hypothesis 3 is rejected while hypothesis 5 is accepted.

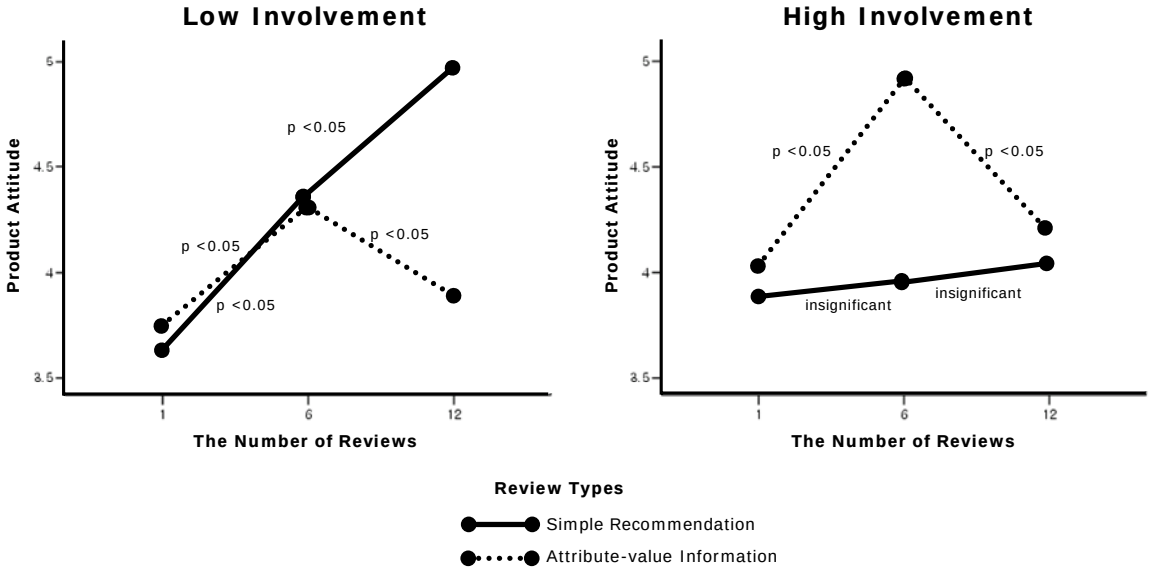

Figure 1. Three-way Interaction (type*number*involvement) for Product Attitude

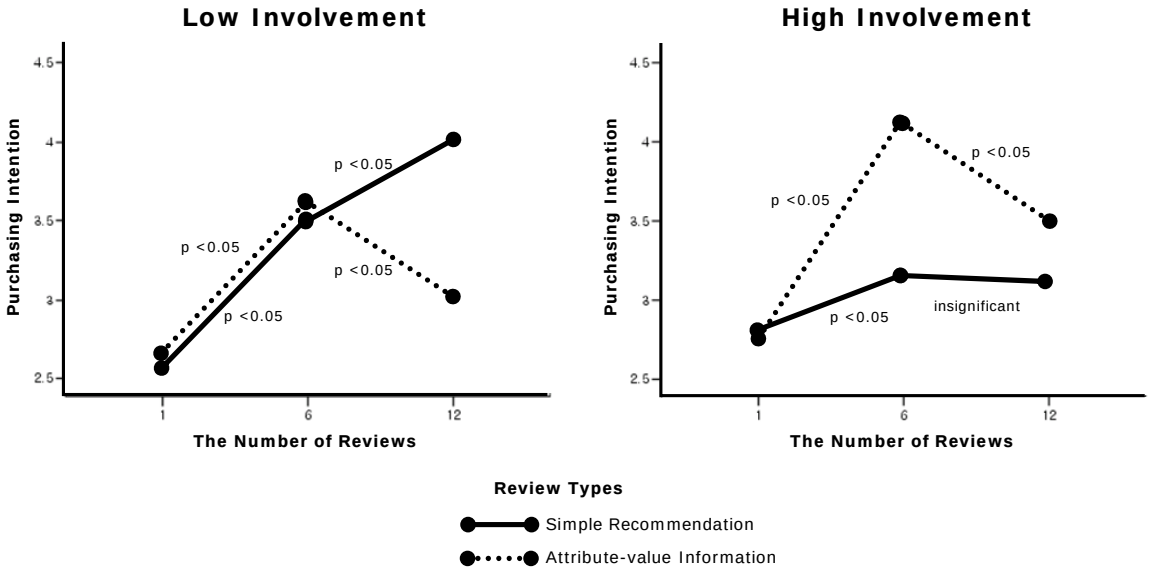

Figure 2. Three-way Interaction (type*number*involvement) for Purchasing Intention

5. Conclusion

Three major findings emerge from this research. First, information overload can occur in the context of online consumer reviews. When a large number of attribute-value reviews are offered, consumers perceive more information overload and feel less confident, less satisfied, and more confused. Previous studies on WOM suggest that the more positive WOM that is provided available, the better it is for the product. They have not considered information overload. Since WOM has the dual role of recommender and information provider, consumers can experience information overload from the perspective of the

information provider. Thus, online sellers need to manage the contents of online consumer reviews qualitatively and quantatively. From the qualitative perspective, online sellers need to provide some rewards or incentives for consumers to post good reviews and a standard review format to help consumers understand reviews easily. From the quantitative perspective, online sellers should not let reviews accumulated continuously. It may lead consumers to experience information overload. It is effective to use a tool that shows a summary of information which represents how many reviews there are and how good the evaluation is. In addition, the tool to show the first line and hide the remaining lines of each review may reduce the perceived information overload. This tool is already used in some online shopping malls.

Second, we show that the number of simple recommendation reviews positively affects product attitude and purchasing intention of low-involvement consumers, but does not change the attitude and intention of high-involvement consumers. These results are consistent with the ELM. In the case of attribute-value reviews, both low and high involvement consumers experience infomration overload. The product attitude and purchasing intention have an inverted U shape with the number of reviews. This result is not the same as the prediction by the ELM, which causes information overload. The prior studies of the ELM have mainly considered advertisements, so the effects of messages in the situation of information overload were not considered. This study shows the persuasion effects of the messages depending on the message type and the number of messages in information overload.

Finally, this study shows that consumers engage in different information processing depending on their level of involvement. Thus, consumer involvement can be used for as a strategic factor. Involvement can be detected through click-stream data because online shopping tasks differ with involvement. For example, the searching task is close to a high-involvement action, while the browsing task is related to a low-involvement action (Hong et al. 2004). If online sellers show reviews with different formats which is fit for the reading strategies, the effect of online consumer reviews will be greater.

There are some limitations to this study. First, we manipulated situational involvement by role playing which is common in psychology literature. Involvement can be manipulated by the product focusing on product categories. Second, this study focuses only on positive online consumer reviews neglecting negative reviews and mixed quality reviews. When there are some negative reviews, the effect of online consumer reviews on purchasing intention can be different from our results. In the ELM, involvement is associated with the motivation to process information and prior knowledge (expertise) is associated with the ability to process information. This study only employed the involvement, and used prior knowledge as the covariate variable. Prior knowledge can affect the perception of online consumer reviews. The effects of online consumer reviews can be generalized through these further studies.

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